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ABSTRACT

To investigate differences in the writing processes of novice and expert writers, a test of writing skills was developed that required subjects to write a business letter in defense of a particular system of public transportation in response to a letter objecting to that system. In the first of three experiments, significant differences were found between the way ten expert writers (college graduates with extensive writing experience) and ten novices (first-semester freshmen with low verbal Scholastic Aptitude Test scores) generated ideas for their letters, generated outlines from given lists of ideas, and translated given outlines into text. In the second experiment, novices were asked to translate given outlines into letters, and the investigator studied the effects on their writing of completing a questionnaire that focused attention on the concerns of the reader of the letter. Results suggested that only 4 of 30 novice subjects addressed their reader's concerns in their letters and that the questionnaire had no effect on performance. In the third experiment it was found that two manipulations--removing the given outlines and increasing the specificity of the complaint letter--dramatically increased response to the audience. The results have implications for the training of writers and for the management of document generation within large organizations. (The paper includes materials used in the experiments and sample letters written by subjects.) (Author/GT)

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DOCUMENT DESIGN PROJECT

Technical Report No. 3

Addressing An Audience: A Study of Expert-Novice Differences in Writing

Marshall A. Atlas

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ABOUT THE DOCUMENT DESIGN PROJECT

In September 1978, the American Institutes for Research, Carnegie-Mellon University and Siegel & Gale, Inc. began the Document Design Project to foster clear and simple writing and design of public documents. The purpose of the Document Design Project is to help make forms, regulations, brochures, and other written materials easier for people to read, to understand, and to use. Funding for the project comes from the Teaching and Learning/Reading and Language group at the National Institute of Education.

The Project's goal is to increase the knowledge and skills of people who produce public documents. To accomplish this goal, the Document Design Project is

- conducting theoretical and applied research studies on language comprehension, on the ways in which skilled and unskilled writers work, on problems associated with different document features;
- working directly with government and private agencies as they produce materials for public use;
- developing courses on writing and design for graduate students and undergraduates.

This report is one of a series of technical and explanatory papers resulting from our research.

If you have any questions or comments on this report or on other work of the Document Design Project, contact Dr. Janice C. Redish, Director, The Document Design Project, AIR, (202) 342-5071, or Dr. Lee W. Gregg, Department of Psychology, CMU, (412) 578-2781.

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Abstract

Studies of writing have traditionally concentrated on the written product, and studies of the actual process of writing have been comparatively rare. Rarer still have been the efforts to assess writing behavior, to objectively compare the writing processes of skilled and unskilled writers. Those attempts that have been made have been either too expensive for easy use - eg., Hayes and Flower's use of protocol analysis - or else have focussed on somewhat narrow issues - like Scardamalia's study of the ability to combine propositions. The current study is an effort to 1) develop an easy-to-use, objectively scoreable test that would tap a wide variety of writing behaviors; and 2) use that test as a means of investigating expert-novice differences. The design of this test was based on two assumptions: first, it is easier to examine components of the writing process separately than to examine the entire process all at once; and second, in order to make legitimate inferences about writing processes, we must first control for the subjects' real-world knowledge - which I did by standardizing everyone's background knowledge before the test began.

To construct a simple instrument, it seemed reasonable to begin with a simple theory of writing, and to test its components separately. For this reason, I chose the framework of the Flower and Hayes model, in which three of the most important processes are: 1) the generation of ideas; 2) the organization of ideas into some kind of framework; and 3) the translation of a framework into text.

Evaluating the mastery of these skills seemed to require a task complex enough to demand their extensive use, and yet sufficiently well-defined to ensure that all subjects would understand the problem similarly and have enough background information to deal with it. For these purposes, the task of writing a business letter seemed a good choice - the attitude of the letter's recipient could be carefully defined in advance, thus forcing the writer into a rhetorical stance, while the topic of the letter could be made narrow enough to allow the experimenter to brief all the

subjects about it during the experiment.

For this reason a situation was set up demanding considerable tact from the writer: the advocacy of a particular system of public transportation to a handicapped citizens' group whose members had already experienced problems with similar systems. The subject's task was to reply to a letter from the chairman of this group.

In Experiment 1 the subjects, 10 experts and 20 novices, were carefully briefed and then asked to: 1) generate a list of ideas they could use to answer the letter they were given; 2) generate a simple outline from a given list of ideas; and 3) translate a given outline into text. Strong expert-novice differences were found: the experts were far more likely to generate plans instead of simply listing ideas, to add new ideas to their outlines rather than simply rearranging old ones, and to include new ideas in their letters rather than merely copying the ideas - and even their wording - from the outline into their letters. Most important, the experts were more likely to address their reader's concern about previous difficulties; the rest of this study was spent in investigating this difference.

Experiment 2 used a detailed questionnaire to focus the attention of novice subjects on their reader's concerns. Half the subjects were given the questionnaire first, followed by the translation task, while half got the questionnaire second; this allowed us to use the questionnaire both as a treatment and as a test of the subjects' understanding. Of the 30 subjects who completed the task, only 16 clearly understood their relationship to the reader, so there was obviously a knowledge deficit here; but of the 16, at least 13 also understood their reader's concerns while only 4 addressed these concerns in their letters, so there was a production deficit as well. The questionnaire had no effect on performance, so a third experiment attempted to do this by varying the task environment.

Since the outline and the letter being answered were the most important materials used in the task, Experiment 3 varied both of them. Of the 36 subjects who completed the experiment, half were given the outline, half were not; after

finishing their letters, all subjects were asked to reply to a second letter, which acknowledged their previous letter and made more specific complaints than the first letter they replied to. To avoid the misunderstandings of Experiment 2, the briefing procedure was greatly strengthened. Both manipulations dramatically increased response to the audience: removing the outline doubled performance scores, from 25% to 50%, while the second letter raised scores to over 80%. Thus it appears that novice writers are not really insensitive to their readers, but rather are very context-dependent, relying on the most salient cues to tell them what points to address.

These results have important practical implications, both for the training of writers and for the management of document generation within large organizations; these practical implications will be treated in the final chapter.

Introduction

In order to teach writing effectively, it is necessary to diagnose the strengths and weaknesses of the student writer. The central questions of writer education are, or should be: 1) what are the major teachable components of writing skill; 2) how can these components be validly, reliably, and economically measured; and 3) how can they be effectively taught?

Little effort has gone into studying the skills that writers actually use, ie., in studying writing as a psychological process. There is indeed a vast literature on the measurement of writing skills, but the skills being measured have been chosen largely a priori. Some of these skills - the "mechanical" ones like grammar, spelling, and punctuation - are truly essential for many kinds of writing, but these are very low-level skills, which makes tests of them so narrow that the instruments used to measure them look more like tests for proofreaders than for writers (see Braddock, 1976). Higher-level skills, on the other hand, are often conceived of in such general terms that the instruments used to measure them resemble IQ tests (see Bond and Hayes, 1979), and although it may yet turn out that the high-level skills underlying writing ability are merely a subset of those which underlie general intelligence, such a conclusion is certainly premature today.

Research on teaching seems to be even less concerned with the writer's behavior. Most pedagogies have an overwhelmingly structuralist bias, concentrating on the form of the sentence (eg., Mellon, 1969), the paragraph (eg., D'Angelo, 1974), or the essay (eg., Baker, 1973), with little concern for how the writer actually deals with these forms, especially beyond the level of the sentence. Since each of the forms has many variations, acquiring proficiency may take considerable time, so that many studies of teaching have focussed on the effectiveness of entire semester-length courses run by handfuls of teachers; needless to say, such studies produce results that are extremely difficult to generalize, or even interpret.

The main exception to this structuralist bias lies in the area of invention, but here too the focus is not on what writers actually do, but rather on techniques developed

outside of the study of writing. In this case, the techniques are intended to help the writer probe his memory to generate more - and hopefully better - ideas. Such methods certainly do produce a greater quantity of ideas, though the quality has proved more difficult to evaluate (eg., Nelson, Petelle, and Monroe, 1974). But even if the verdict on invention were unambiguous, there is still the question of its importance relative to other writing skills; anecdotal evidence suggests that the students who benefit most from these techniques are those who write well in the first place, an outcome not very reassuring to the teachers of basic English.

In spite of a tradition of ignoring the writer, however, the last ten years have brought considerable progress in answering our first question, ie., in isolating the major procedural components of writing skill. Beginning with Emig in 1971, researchers have successfully used protocol analyses to study the processes involved when writers actually write, and by 1979 Hayes and Flower (in press) were able to produce a sophisticated and reasonably well-supported information-processing model as a framework for describing the activity of writing as a whole.

Progress on our second and third questions, however, has been far less satisfactory. Protocol analyses have indeed uncovered strong differences in the behavior of skilled and unskilled writers (eg., Flower and Hayes, in press), but such studies are so time-consuming that their use tends to be restricted to very small groups of subjects, so that the method is best used as a tool for generating theoretical frameworks rather than as an instrument for measuring writing skills. Furthermore, although some attempts have been made to teach these skills, no rigorous attempts have been made to assess these programs, let alone to determine how teachable these skills really are.

The current study is an attempt to investigate all three questions by means of a different technique, the administration of carefully standardized writing tasks. By factoring the writing process into simpler components and standardizing the writers' background information, it becomes possible to trace what the writers do with the

information they are given, without the expense of following them step by step. Similar approaches have been used previously, but only in the study of lower-level skills - as in O'Donnell and Hunt's Syntactic Maturity Test, which requires students to rewrite a standard paragraph about aluminum as a test of ability to combine sentences (in Fagan, Cooper, and Jensen, 1975). The method can be readily extended to higher-level skills, however, by choosing writing tasks which demand such skills and then carefully briefing the subjects to make sure they all have the same factual knowledge necessary to complete the tasks. The results of such knowledge-standardized tests, free of the SES biases that plague many tests of writing (Bond and Hayes, 1979), should provide considerable information about the subjects' procedural knowledge, ie., about what they do with the standardized information they are given. By comparing the performances of expert and novice writers, it should then be possible to determine which higher-level skills the novices lack, and to develop methods for teaching them these skills.

To generate a reasonable set of tasks, I first constructed a problem which I felt was rich enough to demand a wide variety of skills - the writing of a business letter about a moderately complicated subject in response to a communication from a potentially hostile source. Since Hayes and Flower (in press) had already constructed a high-level model of the writing process, I took advantage of their work by devising tasks to tap three of the major processes they identified: the generation of ideas, the organization of ideas into a framework, and the translation of a framework into text.

This first experiment revealed many differences between expert and novice writers in all of the processes tested; the most striking difference was the novices' failure to address the concerns of their audience in their letters (the translation task). The rest of the study attempted to improve the novices' performance in this area by means of techniques often seen in developmental psychology: in Experiment 2, I used a questionnaire to focus attention on the audience (see Kuhn, 1975, for a review of this approach), and to determine whether the subjects' failure was due to a misunderstanding of the background information, or to a failure to use that

information. In Experiment 3, I simplified the task itself, somewhat in the spirit of Gelman's (1969) study on the conservation of number, so that the cues necessary for the task became much more salient, while irrelevant cues became less so.

The results of these experiments were remarkably unambiguous: even when the subjects clearly understood their audience, they only responded to his concerns when the cues in his letter were strong, and external attempts to focus attention on those concerns - in this case by asking questions - had no effect on performance. These results have important implications for the study and teaching of writing, which will be discussed in the final chapter.

Background: The Study of Writing as Behavior

Although the teaching of writing is one of the main concerns of American education, only recently has serious attention been given to the question of how people actually write, and in particular, what kinds of behavior make the difference between skilled and unskilled writing. Thus, when Emig reviewed the literature in 1971, she found no experimental studies at all: the little work that had been done relied either on anecdotal evidence or on post hoc analyses of the rough drafts of professional authors.

Unfortunately, this indifference to the activities of the writer is no accident; it is the result of a tradition of nearly two centuries. By the early 1800's, composition, designed to bring basic literacy to a wider public, had become a discipline markedly different from traditional rhetoric (Emig, 1971). In the years that followed, it focussed more and more on the analysis of the written product into simpler, more teachable, static structures (Berlin and Inkster, 1979). The end result is a rhetoric characterized by "the emphasis on the composed product rather than the composing process; the analysis of discourse into words, sentences, and paragraphs; the classification of discourse into description, narration, exposition, and argument; the strong concern with usage (syntax, spelling, punctuation) and with style (economy, clarity, emphasis); the preoccupation with the informal essay and the research paper; and so on." (Young, 1978).

The success of modern linguistics has strengthened this structuralist bias. Thus Chomsky's transformational grammar has inspired the syntactic complexity measures of Hunt (1965), the sentence-combining techniques of Mellon (1969) and O'Hare (1973), and the generative rhetoric of Christensen (1967). Above the sentence level, formalizations like Pike's tagmemics (1964) have foreshadowed the readability studies of Kintsch and Vipond (1977) as well as the generative rhetorics of Winterowd (1970), Larson (1971), and D'Angelo (1974).

None of this literature gives much attention to writing as an activity; there is little explanation of how the writer transforms these static structures into text.

Composition textbooks deal with this problem mainly by fiat, prescribing that the flow of the text should reflect the flow of the writer's thought, and that planning (usually outlining) should precede writing (eg., Baker, 1973). Only recently have we begun to look more carefully into the matter.

The first detailed investigation of writing behavior was done by Janet Emig (1971), who combined tape-recorded protocols and interviews to study the writing processes of eight twelfth-grade students. The result of this work was not really a model of the writing process, but rather a catalog of writing activities - planning, reformulating, stopping and contemplating product, etc. - together with some observations on when these activities occurred. The principal weakness of the study was the absence of a comparison group, which left it unclear which behaviors were characteristic of good writing and which were just incidental activities typical of twelfth-graders.

Although such theoretically unfocussed protocol analyses are still being done (eg., Perl, 1978), there has been a recent shift toward more sophisticated designs, as well as more complete models of writing. Thus Hayes and Flower (in press) have applied the model-building techniques of Newell and Simon (1972) to produce a fairly detailed information-processing model of writing, and by comparing expert and novice writers they were able to show that experts spend much more of their time planning than novices do (Flower and Hayes, 1980) and focus much more of their planning on the audiences they are writing for (Hayes and Flower, 1979).

An interesting variant of protocol analysis was used by Graves (1979) to study the writing behavior of seven-year-olds. Since children this age do not volunteer good protocols, the subjects were asked detailed questions as they wrote (eg., "Tell me what you're going to write about next."). The data gathered with this technique showed that boys tended to be "reactive" - using erratic, very local problem-solving strategies - while girls tended to be more "reflective". An examination of the written products showed further that girls tended to write more than boys, unassigned work tended to be longer and more varied than assigned

work, and informal environments tended to be more productive than formal ones.

But protocol analysis is a very expensive source of data - Flower and Hayes' (1980) expert-novice study, for example, used only nine subjects, but required about six hours of tape-recorded protocol per subject, and many hours of analysis for each hour of protocol. Furthermore, there is the risk that protocol taking interferes with the process of writing itself. Some adults find that talking aloud changes the direction of their thoughts, sometimes so much that they can't concentrate on their writing. Thus there is always the possibility that the subjects might have written differently had they not been required to talk aloud.

One way around these difficulties is to passively record the subjects' behavior without asking them to think aloud. Thus Gould (1976, 1977) and Gould and Boies (1977) gave their subjects standardized letter-writing tasks and asked them either to dictate letters - in which case their performance was tape-recorded - or write their letters - in which case a videotape camera was used. The main disadvantage of this technique is that it limits what can be said about the subjects' actual behavior; thus Gould's subjects only engaged in three kinds of observable activities - generating, pausing, and reviewing - and most of his data is based on how often they performed each activity and how much time they spent at it. Since planning behavior cannot be observed directly this way, Gould was forced to infer its presence indirectly, from the fact that producing a letter takes much more time than simply repeating it (by reading, speaking, or writing, depending on how it was generated in the first place); to estimate planning time he therefore treated it as that part of generation time not spent in repeating words as quickly as possible (more precisely, he used the formula: planning time = generate time - (mean no.words/max.possible WPM)), a rather shaky assumption. An interesting feature of these studies was the use of uniform and detailed background material for all of the tasks, allowing a meaningful comparison of the written products. Unfortunately, the subjects were chosen only on the basis of their experience in dictation, not in writing, and it turned out that novices rose to near-expert levels of performance with only a few hours of practice, so comparisons between the two groups were not

as fruitful as they might have been.

An earlier piece of work by Stallard (1974) applied very similar techniques to study writing, comparing high school seniors of high ability to seniors of moderate ability. The writing tasks used, however, were almost entirely uncontrolled - each student was even allowed to choose his own topic - making a comparison of the written products almost useless. Furthermore, Stallard found the same difficulties in interpreting his "silent protocols" that Gould did, so that most of his data came from post-experiment interviews with the subjects.

A purer example of an interview study was done by Sommers (1978), who studied the revision process by asking her subjects, 8 novices and 8 experts, to write and revise three essays, and then interviewing them after each essay was completed. Interviews are a remarkably cheap source of data, but their validity depends heavily on the accuracy of the subjects' self-knowledge; for this reason, interview data is probably best treated as weak evidence, suggestive but not conclusive. Thus Stallard and Sommers both tried to strengthen their conclusions by referring to other sources of evidence, Stallard using protocol data and Sommers using the written products. In both cases the results were much weaker than they might have been had the investigators not relied so heavily on interview data.

Like interview studies, naturalistic studies are both cheap and widely applicable, but lack precision. Thus Mina Shaughnessy (1977) was able to examine thousands of basic (ie., remedial) writing students to get a picture of the processes by which these writers generate their more common errors; but the data she used were mostly anecdotal reports by writing teachers rather than direct observations of students, and most of these teachers' reports were based on talking with the students and examining their written work, not on watching them write. As a result, Shaughnessy's conclusions depend on a rather long chain of guesswork, particularly in the case of errors "beyond the sentence", where the data are harder to get.

A more controlled variation of this method was used by Britton et al (1975), who

examined more than 2000 classroom essays by 500 students writing on preselected topics. The tasks were not very well controlled, the writers being free to choose both their audience and their approach to the topics; the data analysis was then devoted to characterizing their choices. Not surprisingly, over 90% of the subjects chose to address their teachers, either in a teacher-learner dialogue, or in the role of pupil to examiner. This, unfortunately, tells us little about what they were capable of; it simply tells us what students in a classroom writing situation chose to do.

A final research strategy involves the use of carefully standardized, objectively scored tests. These allow a reliability greater than that of protocol analysis, and a generality at least equal to that of naturalistic methods. This approach, however, is something of a gamble: while protocol analyses and casual observation almost always yield some useful data (especially in a field as new as the psychology of writing), a poorly designed test may produce nothing at all. For this reason, the researchers who use this method have focussed mainly on very well-defined problems, usually dealing with a single - often low-level - skill. Thus O'Donnell and Hunt's Syntactic Maturity Test asks students to rewrite a standard paragraph of short, choppy sentences, purely as a test of sentence-combining ability (reported in Fagan, Cooper, and Jensen, 1975). Marlene Scardamalia (1977) gave her subjects - mostly primary school students - 2X2 matrices, each embodying four propositions, to be translated into text, and the most advanced performance possible was to combine these propositions into a single sentence.

Higher-level skills have also been studied, however. By having their subjects write directions on how to draw the same geometrical figure, Scardamalia, Bracewell, and Bereiter (1978) were able to establish that all three of the age groups studied - 4th, 8th, and 12th graders - produced more audience-oriented statements than they did for less realistic classroom exercises, but not until grade 12 did the subjects rewrite their compositions in a way which improved the quality of their writing. The main difficulty with this design is that knowledge of drawing has not been controlled for, so that the younger subjects' performance may not be due to a

lack of audience concern so much as the lack of a set of terms adequate to handle the products and processes of drawing; if so, it is possible that these subjects might not even be able to describe the figure well enough so that they themselves could reconstruct it.

Another study of audience sensitivity, both richer and better controlled, was done by Scardamalia, Bereiter, and McDonald (1977), who taught their subjects how to play a new game and then had them write an explanation of the rules for someone else; this allowed a complete control of topic knowledge, so that writing knowledge could be studied separately. By constructing a list of all the ideas necessary for understanding the game, the investigators were able to objectively score the number of ideas the writers used, thus providing a powerful technique for measuring content. The use of covariance analysis to relate the number of ideas to the number of words produced made it possible to derive indirect measures of "wordiness", "economy", and "ineffectual words", and to show that a sensitivity-training manipulation - presenting the videotape of an ineffectual attempt by one person to communicate the rules of the game to another - substantially increased the number of ideas produced while reducing wordiness and ineffectual words. Although there is some question as to the validity of such indirect measures - particularly when "economy" failed to vary inversely with "wordiness" - and a comparison with skilled writers would certainly have been useful, the counting of ideas in a knowledge-controlled task was clearly a valuable contribution.

A much broader set of issues is tapped by the standardized college placement tests (SAT-V, TSWE, etc.), but their usefulness in studying the writing process is severely limited. The best known complaint about them is that the real-world knowledge needed for many of the tasks they contain has not been controlled for cultural differences, so that they automatically favor white, middle-class males (Labov, 1972). In our terms, the problem is that performance on these tests may not really be reflect writing ability or the skills which underlie it, but rather a set of cultural biases about usage and style. This is particularly a problem with holistically scored essays (see Cooper and Odell, 1977), but many multiple-choice tests suffer

from it as well. Even when such tests are intended to measure high-level skills (eg., organization), the test items often reflect a concern with a very small number of standard formats, whether appropriate or not - eg., Braddock (1976) cites items which request topic sentences even when none are necessary.

A further difficulty is that the skills these tests are designed to measure do not derive from any tested theory of how writers write, but rather were invented a priori. Thus, even if performance on the tests correlated highly with writing performance, there would be no guarantee that writers actually use these "skills" in writing, or that teaching these skills to novices would do them any good.

Neither essay nor multiple-choice tests tell us much about writing as behavior: on the one hand, we do not yet know enough to ask the right multiple-choice questions; on the other hand, essay tests concentrate too much on the written product, are hard to evaluate objectively, and fail to control for the different amounts of real-world knowledge that subjects bring to the task. For research our best bet is a tool combining the richness of the essay test with the precision of standardization.

Experiment 1: A Test of Writing Behavior

The central feature of this study is the use of a carefully standardized letter-writing assignment. Using a complex writing task made it more likely that some of the richness of writing behavior could be captured; careful standardization of the information given to the subjects made it easier to control their real-world knowledge, to get results that were a function of what they did with the information given rather than what they already knew about the topic. Furthermore, the standardization of the task was intended as an aid in finding objective measures of behavior, since the writer's output could then be meaningfully compared to his input. In information-processing terms, both the subjects' task environments and the contents of their long-term memories (Newell and Simon, 1972) were controlled, so that the writing process itself could be examined.

But even with standardization, writing remains a complex activity, composed of many interacting parts. For this reason, it makes sense to factor the writing process into subprocesses that are easier to study. Such an approach by no means captures the entire writing process - there is still the question of how the subprocesses are coordinated - but it provides a major step forward. To use this approach, it seemed reasonable to begin with a breakdown of the writing process that was relatively simple; for this purpose I chose the model of Hayes and Flower (in press), concentrating on three of its major processes: 1) the generation of ideas; 2) the organization of ideas into some kind of framework; and 3) the translation of a framework into text. Another good reason for choosing these processes is that the terms which describe them - like "brainstorming", "outlining", and "writing" - are familiar enough for most people to easily understand what is being asked of them. Indeed, these processes are referred to in many English courses and composition texts, which often try to teach them as separate activities (eg., Hairston, 1974).

Evaluating the mastery of these skills seemed to require a task complex enough to demand their extensive use, and yet sufficiently well-defined to ensure that all subjects would understand the problem similarly and have enough information to deal with it. For these purposes the task of writing a business letter seemed a good

choice - the attitude of the letter's recipient could be carefully defined in advance, thus forcing the writer into a rhetorical stance, while the topic of the letter could be made narrow enough to allow the experimenter to brief all the subjects about it during the experiment.

Methods

To accomplish the aims outlined above, I set up a situation which demanded considerable tact from the writer: the advocacy of a particular system of public transportation for the handicapped to a citizen's group whose members had suffered bad experiences with similar systems. The subject's task was to reply to a letter from the chairman of such a group. In order to standardize the subjects' knowledge of the task and test each of the skills of interest, the experiment was organized as follows:

1. The subject was told to play the role of the head of a private firm of urban design consultants. He was then given ten minutes to read the transcript of a simulated conversation between himself and one of his subordinates, who was filling him in on the details of the new transportation system. This provided all the subjects with a common body of knowledge about the task.

2. The briefing information was removed, and the subject was given the letter he would have to answer and told he could use the letter as a reference for the rest of the experiment. He was then asked to write down the ideas he thought he would need to answer the letter. This was the idea-generation task.

3. When the subject finished, his list of ideas was removed, and he was given a set of questions about the task and asked to answer them briefly. After ten minutes, the experimenter reviewed his answers with him to make sure that he understood the task well.[1] The question-and-answer sheet was then removed, and the subject was given a scrambled list of all the ideas presented in the conversation of

[1] In the original design of this experiment, Step 3 preceded Step 2, so that the subjects' knowledge could be standardized right from the beginning. A pilot study showed, however, that if the questionnaire was given first, novices tended to simply write down three or four of its ideas, instead of generating any of their own; the design was therefore changed to encourage more originality.

Part 1. He was then asked to: 1) cross out all the ideas he thought irrelevant to the task; and 2) write a very simple outline for his letter (a model for this outline was presented). This was the idea-organization task.

4. When the task was completed, the subject's outline and the list of ideas were removed, and he was given another outline and asked to write the actual letter, using the outline as a starting point. This translation task was the last part of the experiment (the experimental materials are all presented in Appendix 1).

Although this experimental design completely separates the processes of generation, organization, and translation from one another, it should be noted that writers do not usually do so; in fact, Flower and Hayes (in press) found that many writers jump back and forth among these processes frequently, generating a few ideas, organizing them, translating a few ideas into text, etc. For this study, however, the focus is on the subprocesses themselves, and not how they are organized into a whole, so the design should be adequate for that purpose.

The study employed ten expert and twenty novice writers. The experts were all college graduates with extensive writing experience, whose colleagues had singled them out as good writers; five of them earn their living by writing, and four more produce frequent scholarly works. Initially there were ten novices, all first-semester freshmen whose Verbal SAT scores were no greater than 500, all unpaid volunteers satisfying a course requirement.

Upon examining the novice data it became apparent that half of these writers tended to imitate the experimenter's wording of ideas very closely - the "mimics" - while the rest did not (the precise measurement of this imitation will be discussed below). For this reason it was decided to obtain enough novice subjects to have ten mimics and ten non-mimics to compare to the experts. The new subjects were obtained in the same way as before, but a shortage of volunteers made it necessary to include one second-semester freshman (mimic) and one subject with a VSAT of 540 (non-mimic) to complete the design. The two groups of novices did not differ significantly on VSAT scores: the mimics' scores ranged from 400 to 500, with a

mean of 445; the non-mimics from 370 to 540, with a mean of 427 ($p>.40$, $t(18)=.771$). Except where there are strong differences between the two groups of novices, their data have been pooled.

Most subjects found the task straightforward, if not necessarily easy; only two were eliminated from the study. One, a novice, misunderstood the assignment and wrote a letter to the wrong person; the other, an expert, refused to complete the letter because he felt a telephone call would be more appropriate.

Results

Idea Generation

Both experts and novices varied widely in their styles of dealing with this task, some producing only a short numbered list of sentence fragments, others writing extended comments that were almost essays, longer than the final letter itself. The principal difference between experts and novices, however, was that experts were far more likely to make strategic comments about the information they were examining in addition to simply listing ideas. Thus 70% of the experts made comments like "Be sure to include this.", "Are there other alternatives?", etc., as opposed to only 15% (1 mimic and 2 non-mimics) of the novices ($p<.005$ by Fisher exact test, 1-tailed); 50% of the experts made such comments about their intended audience - eg., "Invite his contributions on this point." - as opposed to only 15% of the novices ($p=.056$ by 1-tailed exact test); and 60% of the experts made such comments about information not directly related to the audience - eg., "Why not a mixed plan like this?" - as opposed to only 10% (1 mimic and 1 non-mimic) of the novices ($p<.01$ by exact test). It seems reasonable, then, to claim that experts are much more willing than novices to engage in complex, explicit planning, though their plans are often tentative rather than final. Indeed, this conclusion is given further support by the results of Flower and Hayes' protocol analysis study (in press), which found that experts spent much more of their time planning than did novices.

Idea Organization

This task provided the subjects with a numbered list of ideas and required them to produce a simple outline. The novices tended to use only the ideas presented, while most of the experts added their own ideas as well; thus 80% of the experts introduced new ideas, versus only 15% (2 mimics and 1 non-mimic) of the novices ($p<.001$ by exact test). A further, though statistically much weaker difference, was the tendency of the novices to refer to the ideas in the list only by number, without even bothering to reword them. Thus, 55% of the novices (6 mimics and 5 non-mimics) used only numbers to refer to the subtopics in their outlines versus only 20% of the experts ($p=.074$ by exact test). The absence of any difference between mimics and non-mimics on these two tasks suggests that imitation is a strategy peculiar to the activity of translation, and not part of a more general strategy.

Translation into Text

This task provided the subjects with a simple outline and instructed them to "Write the actual letter, using the outline as a starting point (you may add or remove whatever ideas you wish)." As in the idea-organization task, here again the novices showed less originality than the experts, in many cases adhering closely to the outline. One of the most striking aspects of this conformity was the tendency of half the novices to imitate the actual language used in the outline. This was measured as follows: each of the ideas presented in the outline was rated separately; each time a writer expressed one of these ideas in his letter, his wording would be compared with the wording in the outline, and the number of words appearing in the same order in both would be counted. Thus the writer's "It would nice to have door-to-door service rather than waiting on a street." has seven words in common with the idea "door-to-door service versus waiting on the street" which appears in the outline. The total number of words the writer took from the outline in this manner was then counted, and divided by the total number of words in his letter. The ten mimics had borrowing scores ranging from 15.3% to 39.5%, with a mean of 23.0%, while the ten

non-mimics had scores ranging from 2.3% to 12.7%, with a mean of 7.4%. The scores of the expert writers ranged from 0.8% to 8.2%, with a mean of 4.1%; this was significantly less than even the non-mimic score ($p<.02$, $t(18)=2.633$). Much of this difference, however, is accounted for by the fact that the experts used more words overall (see below); if we count the number rather than the percent of words borrowed, we find that the experts borrowed an average of 16.3 words, as opposed to the non-mimics' 19.5 ($p>.40$, $t(18)=.756$); on the other hand, the mimics borrowed an average of 47.8 words from the outline, more than twice the non-mimics' score ($p<.0002$, $t(18)=4.682$). Thus imitation is a real effect, not merely an artifact of the mimics' shorter letters.

Another measure of conformity to outline was obtained by counting the number of ideas used in the letter. Of the 27 ideas listed in the idea-organization task, the outline in the translation task uses only the ideas numbered 14, 11, 21, 24, 12, 6, and 7 (see Figures 5 and 6). The expert writers used an average of 3.6 of these ideas, as opposed to 4.0 for the non-mimics and 5.4 for the mimics. This effect was significant at the .05 level (a 1-way ANOVA yielded $F(2,27)=3.72$), as were the differences between the mimics and each of the other two groups (by Newman-Keuls test). On the other hand, the expert writers used 5.4 of the numbered ideas which were <u>not</u> included in the outline, as opposed to only 3.5 for the non-mimics and 1.7 for the mimics ($p<.01$, $F(2,27)=6.75$ by 1-way ANOVA); a Newman-Keuls test showed a .05-level difference between the experts and the mimics, the other two differences just barely missing that level. Thus the experts not only drew fewer of their ideas from the outline, they drew more ideas from outside it.

Another place the experts drew ideas from was the letter they were asked to reply to. Figure 7 shows a list of 8 issues raised in that letter that a writer could mention or respond to. On the average, the experts responded to 4.2 of these, compared to only 2.4 for the novices ($p<.005$, $t(28)=3.21$; the scores of mimics and non-mimics were almost identical on these measures, so their data are pooled). This difference was largely due to the fourth and fifth items on the list. Where 70% of

the experts mentioned that the old system of minibuses was badly run, only 30% of the novices did so ($p<.05$ by exact test); this is a crucial oversight, since the proposed new system also involves minibuses. Similarly, 70% of the experts mentioned the fact that the old systems were privately run, while only 15% of the novices did so ($p<.005$ by exact test); this gave the experts a way to contrast the new and old systems that the novices lacked.[2] Thus the experts were far more likely than the novices to respond to the issues that actually concerned their audience. This effect was especially striking because both groups were responding to the same brief letter, which was available to them at all times.

The experts also tended to respond to their audience by personalizing their first paragraphs. Thus in 70% of the experts' letters, the subject of every predicate in the opening paragraph was either a personal pronoun or a noun phrase modified by a personal pronominal adjective ("your organization", "our proposal", etc.); this was true of only 15% of the novices ($p<.005$ by exact test).

The writers also differed in the amount of time they spent working on the letter, the mimics averaging 21.8 minutes, the experts 30.0, and the non-mimics 36.2 ($p<.05$, $F(2,27)=4.72$ by 1-way ANOVA). A Newman-Keuls test showed only the difference between the mimics and non-mimics to be significant ($p<.05$), which is consistent with the hypothesis that plagiarism saves time. Interestingly enough, even though the experts spent no more time than the non-mimics, their letters were considerably longer, averaging 419 words in comparison to the non-mimics' 260 ($p<.0005$, $t(18)=4.47$); the mimics' letters were even shorter, averaging 209 words ($p<.08$, $t(18)=1.86$). Thus overall length seems to be consistent with our other measures of content. The fact that the experts were able to produce so much more

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[2]These two items were scored conservatively, ie., the reference to each idea had to be direct, clear, and unambiguous. If this criterion was relaxed enough to admit any remotely plausible reference, then scores for the issue of private ownership remained the same, but scores for references to old problems were now 20% for mimics, 70% for non-mimics ($p<.05$), and 80% for experts. This pattern of results was not replicated in Experiments 2 and 3, however, where: a) the number of non-mimics was small; b) the scores of mimics and non-mimics were about the same; and c) relaxing the criterion made no change in any of the patterns of results. For this reason, the results of these experiments are all reported only in terms of the strong criterion, since it was easier to use, requiring a less careful reading of the letter.

content than the non-mimics without taking any more time to do it underlines the differences between experts and novices. Indeed, the experts produced an average of 14.9 words per minute, in comparison to the mimics' 10.3 ($p<.02$, $t(18)=2.57$) and the non-mimics' 8.1 ($p=.10$, $t(18)=1.71$); thus imitation does tend to increase the novices' rate of production, but nowhere near to expert levels.

Not surprisingly, the experts' writing was grammatically more complex than that of the novices (the two groups of novices showed no differences here). Thus the experts averaged 18.4 words per T-unit, compared to the novices' 15.9 ($p<.05$, $t(28)=2.30$); 80% of the experts used a semicolon, dash, or parentheses to combine two sentences, compared to only 20% of the novices ($p<.003$ by exact test); 1.32% of the experts' words were past participles used as adjectives (disregarding "handicapped" and "lift-equipped", which everyone used freely), compared to only .48% of the novices' words ($p<.0005$, $t(28)=3.95$); and 1.34% of the experts' words were "and", "or", or "but" used to join non-clausal phrases longer than single words (eg., "both the minibus and the public bus system"), compared to only .55% of the novices' words ($p<.00001$, $t(28)=5.48$).

An additional perspective on expert-novice differences was obtained by using a holistic rating procedure. The letters of the ten experts and the ten original novices in the study (five mimics and five non-mimics) were prepared for judging by typing them into a standard form and correcting all spelling, punctuation, and agreement errors, so the raters would not be influenced by these obvious cues. The twenty letters were then shuffled, and presented in a different random order to each of four raters. The raters were teachers of college English who had no prior knowledge of the writing task. Each rater was asked to read the background conversation and the letter from Mr. Beyer, and then told to rate the writers' letters as responses to that letter (they were not told about the rest of the task). Each paper was to be labelled "expert" or "novice", and then rated according to language use, coherence, explanation and development, effectiveness, and personal impression of the writer (see Figure 8 for the rating instructions). The results are summarized in Figure 9; I will simply note here that each of the four raters discriminated strongly between the

two groups on nearly every measure: only one novice received a single "expert" vote, while every expert received at least 1 (the average was 2.6); and in each of the five categories, the novices averaged around 2 (on a 4- or 5-point scale), corresponding to "only fair" performance, while the experts averaged better than 3, "moderately good". These differences can be only partly explained in terms of the measures discussed previously; thus, the judgment of language use is probably related to grammatical complexity (not to mention simple correctness), and effectiveness and personal impression are probably related to the issues of content and style raised earlier. Objective measures of coherence and explanation and development, however, are much harder to construct. Even though all four judges could easily separate experts and novices, I found no objective measures of organization that could do so. Many writers - in both groups - followed the outline approximately, but few followed it exactly; both groups made extensive use of syntactic transition devices, unlike the younger subjects described in the literature (eg., Rentel, King, and Pappas, 1979); and neither group seemed to favor any distinctive style of argumentation or arrangement of the data. In this area, then, holistic scoring is still the only workable alternative to the costly methods of structural analysis (eg., Chapter 10 of Pike and Pike, 1977) - a conclusion which suggests how far we have to go.

Discussion

This study clearly demonstrated the value of careful task standardization by allowing us to use measures of content as well as measures of form to examine writing behavior. It is all the more significant, then, that in spite of all subjects' being given the same carefully detailed briefing and the same well-defined tasks, there were still striking differences in the behavior of experts and novices. Not only did the experts show greater stylistic and grammatical sophistication, as one might expect, but they were also far more likely to go beyond the narrow constraints of the task, formulating plans in addition to listing arguments, generating new ideas in addition to re-organizing old ones, writing letters whose ideas and language were drawn from beyond the suggested outline, focussing on the concerns expressed by

their intended audience. Among the novices, the mimics and non-mimics differed solely in how they produced text, and neither group was able to match the productivity of the experts, either in terms of real content - where the non-mimics had the advantage - or in terms of rate of production - where the mimics did. These results raise some important pedagogical issues, since it is not clear to what extent the experts' behaviors can be taught to novices as simple rules of thumb, like those suggested by Flower and Hayes (1977), and to what extent the effectiveness of such rules depends on more detailed kinds of knowledge (eg., of grammar, logic, rhetoric, etc.). In any case, carefully controlled writing tasks such as this one should provide a valuable tool in locating the sources of these difficulties - as I will show in the experiments that follow.

Experiment 2: Focussing Attention on the Audience

Certainly the most striking effect revealed in Experiment 1 was the failure of most of the novices to address the concerns of their audience. Even though Mr. Beyer, the author of the letter they were answering, complained about past transportation systems "in the form of a few privately owned minibus services, some of which were very badly run", only 30% of the novices tried to reassure him that the newly proposed minibus system would be different from the old one; and only 15% mentioned private ownership as a possible source of the difficulty.

The problem of how a writer understands his audience does not have an extensive literature. Both rhetoric and social psychology are deeply concerned with audience analysis, but the focus of their concern has been the psychology of the audience, not that of the writer. Nonetheless, some good work has been done in this area, most of it developmental.

The concept of egocentrism, derived from Piaget's work, seems at first a natural tool for studying the acquisition of rhetorical skill, but as Gluckberg, Krauss, and Higgins (1975) point out, explanations that attribute communication failure to egocentrism tend to be either vague or circular; "virtually any poor message (that is, a message conveying no useful information) could be characterized as egocentric".

A more promising approach comes from Flavell's (1974) analysis of "role-taking". In ordinary usage, this term refers to a person's ability to imagine himself in someone else's place; as Hayes and Flower (1979) have shown, if the term is used in this sense then very few writers, novice or expert, actually engage in role taking. Flavell, however, has extended the meaning of the term to describe a model of audience-analysis behavior consisting of the following components: 1) the writer must be aware of the existence of the relevant characteristics of his audience; 2) he must be aware of a need to apply his knowledge; 3) he must be able to infer a course of action; and 4) he must apply his inference to the problem. Although the boundaries between these concepts are too fuzzy to make this framework useable

for investigations of any depth, it is quite adequate as a starting point for generating a good first research question - namely, to what extent is the failure to address an audience (in this case Mr. Beyer) due to a lack of knowledge, either about the subject matter or the audience, and to what extent is it due to a production deficit - a lack of procedures for dealing with that knowledge?

Methods

To answer this question, I performed an experiment in which each writer was given a detailed four-page questionnaire (see Appendix 2) designed to focus his attention on - and test his knowledge of - Mr. Beyer's attitude toward the new minibus system. Half of the writers were given the questionnaire before being asked to write their letters, while half got it afterwards, so that it served as a treatment as well as a test. The experiment was administered to three sections of a basic writing course, and took three 50 minute class periods to complete. It was organized as follows:

Day 1

1. The students were given the same briefing instructions as in Experiment 1: they were told to play the role of the head of a private firm of urban design consultants, and then given 10-15 minutes to read the same conversational briefing used in Experiment 1 (see Figure 1).

2. When all the students had finished, they were given the same set of questions about the task as in Experiment 1 (Figure 4), and asked to answer them briefly. After they had finished (about 15 minutes), the experimenter reviewed the answers in class and answered their questions about the briefing materials, to make sure they understood the task well.

Day 2

1. Each student was given a copy of Beyer's letter (Figure 2) and told to imagine that he had just received it in the mail. After reading the letter, which he was allowed to keep as a reference, he was given an envelope with his name on it, containing either 1) the questionnaire

(Figure 10); or 2) the outline for writing a reply to Beyer's letter (Figure 6), and some lined paper. He was then told to do whatever the contents of the envelope asked for, and to put everything back in the envelope when he was finished.

Day 3

1. Each student was given a copy of Beyer's letter, along with the student's personal envelope, which contained the materials he had used on Day 2, together the materials for whichever task he had not yet worked on. He was told to complete the new task, referring to the old materials in the envelope if he wished, and to put everything back in the envelope when finished.

2. For homework, each student was given a follow-up questionnaire (Figure 11) asking what parts of the experiment gave him the most trouble and what he thought the experiment was about.

The subjects were all students in Basic Writing 1, the lowest level composition course taught at the West Mifflin campus of the Community College of Allegheny County (CCAC South Campus). These students were, on the average, older than the C-MU freshmen who served as novice subjects in Experiment 1; many were workers and housewives who had been out of high school for several years.

To acheive a balanced design, the instructor, who taught all three sections of the course, was asked to holistically divide each section in half - better writers vs worse writers; the students within each of these subgroups were then randomly assigned to the two treatment conditions.

Of the 52 students who attended the first day, only 39 were present all three days; of these 39, 9 failed to complete their letters in the 40-45 minutes of class time available, leaving 30 subjects, 13 of whom had received the questionnaire first, while 17 had gotten it second. To compare these writers on the basis of ability, I asked the instructor to holistically sort them into three skill groups on the basis of past performance; 11 were labelled high, 10 medium, and 9 low.

Results

Knowledge Deficits

The most important skill-related difference was that the low-skilled writers did not understand the audience as well as the others. The answers to the questionnaires showed that 67% of the low group misunderstood Beyer's attitude toward the new minibus system and assumed him to be already sympathetic; by contrast, only 10% of the medium group and 27% of the high group made this assumption (pooling the medium and high scores gives us 67% vs 19%, $p<.02$ by exact test). At least four members of the low group (44%) explicitly assumed that Beyer did not share the attitude of the handicapped people he spoke for; this is not an impossible reading of Beyer's letter, but writing a reply to him on the basis of that assumption is a very unsound rhetorical strategy.

Another source of misunderstanding was a confusion about who Mr. Beyer was and what his relationship to the writer was supposed to be. When asked what questions they would ask Mr. Beyer if they had the chance to talk with him, 55% of the low group asked questions to which Beyer could not possibly have known the answers (eg., "How much will the minibuses cost?"); by comparison, only 10% of the middle group and 0% of the high group made such mistakes (55% vs 5%, $p<.005$ by exact test).

Of the 30 students who completed the task, a total of 16 - 1 low, 7 medium, and 8 high (11% vs 71%, $p<.004$ by exact test) - showed by their answers that they understood both Beyer's role and his attitude toward the new system. These 16 subjects showed no other differences due to skill level, so their results will be pooled in the analysis that follows.

It should be noted, by the way, that treatment condition had no significant effect an any of the above measures. The strongest difference was in the number of subjects who understood Beyer correctly: 69% of those who got the questionnaire

on Day 2 did so, as opposed to only 41% of those who got it on Day 3 (p=.12 by exact test). To the extent that these figures reflect a real difference, it might be due to the forgetting of background material over an additional class period; even so, Beyer's letter was available at all times, so any explanation - if one is needed - must be more complicated than that.

Production Deficits

Although lack of comprehension accounts for much of the data - 3 of the 30 showed no evidence of understanding their audience, and 11 showed clear evidence of misunderstanding - there was still a large production deficit: even of those subjects who clearly understood, few responded to Mr. Beyer's concerns, and treatment condition made no difference. Of the 16 subjects who understood Beyer correctly, 9 had been given the questionnaire first and 7 got it second; only four of the 16 (25%), two in each treatment condition (22% vs 28%, $p>.40$), mentioned the problems with the old minibus system in their letters, while only two of the 16 (13%), one in each treatment condition (11% vs 14%, $p>.40$), mentioned private ownership (in the analysis that follows, the data from these two groups are pooled). Furthermore, although only 4 of the 16 mentioned old minibus problems in their letters, 13 did so in the questionnaire (25% vs 81%, $p<.002$ by exact test); although only 2 of the 16 mentioned private ownership in their letters, 7 did so in the questionnaire (13% vs 44%, $p=.057$). Thus, even when those subjects who misunderstood the task were eliminated, there was still a large number who clearly understood both the audience and the issues and yet failed to respond adequately to Mr. Beyer.

How, then, can this performance deficit be explained? Some insights can be gained by examining the subjects' responses to the follow-up questionnaire, which 15 of the 16 completed. Of these 15, only two found the actual writing difficult, but a total of eight complained about difficulties in understanding the task, and six of these eight claimed they had trouble figuring out what Beyer wanted from his letter (eg., "The letter didn't give me enough information to answer the questions.", "Is he

totally opposed?", "Why didn't the handicapped like the minibuses?"). Since it is much easier to reply to Mr. Beyer without this kind of information than it is to answer the questionnaire without it, it is not surprising that five subjects mentioned difficulties with the questionnaire, and three of these claimed it was the hardest part of the task; indeed, it is possible that many of those complaining about difficulties in understanding were actually referring to the questionnaire. If so, then perhaps the questionnaire had no effect as a manipulation not because it failed to jog the subjects' memories, but because the subjects had no confidence in the process by which they generated their answers to it, and so they were unwilling to use those answers as a guide to writing their letters.

Discussion

Although the audience questionnaire had no effect on performance, it was very effective in extracting information. Its use enabled us to determine that, even though many subjects misunderstood who their audience was and how he felt about the project, there were even more who understood perfectly well and yet still did not use their knowledge to answer his complaints. Furthermore, the answers to the follow-up questions, though not conclusive, suggest that the first questionnaire <u>did</u> focus the subjects' attention on the audience, as it was supposed to, but that many of these could not find enough detail in Beyer's letter to confidently answer the questions. A promising line of attack, then, would be to investigate the effect of changing the content of Beyer's letter; we will address this issue (among others) in the experiment that follows.

Experiment 3: Simplifying the Task

Experiment 2 attempted to prepare the subjects for the letter-writing assignment by having them answer a set of questions as a kind of audience awareness training - a research strategy modelled on the training studies used in developmental psychology (Kuhn, 1975). The failure of this exercise led me to an alternative approach, also popular in the developmental literature: namely, simplifying the task itself until performance improves (eg., Gelman, 1969, simplified the number conservation task by reducing the number of items being compared).

Two possible sources of task difficulty were suggested by some of the subjects. First, one of the experts of Experiment 1 said the task was hard because the outline was so confining; and second, several of the answers given after Experiment 2 implicated the lack of detail in Beyer's letter as a source of confusion. Thus the removal of the outline and the sharpening of Beyer's letter might both be expected to enhance performance.

Methods

Given the failure of the training procedure of Experiment 2, it seemed quite possible that novices might lack any procedural knowledge for dealing with this kind of problem, in which case no modification of the task would do any good. To test this possibility, I designed an experiment which included extremely strong treatments: first, half the subjects were given the outline, half were not; after finishing their letters, all the subjects were asked to answer a second letter from Mr. Beyer which acknowledged their first letter and made far more specific complaints, thus combining precise detail with feedback to the first letter, a combination I hoped would discourage the writers from merely repeating their old arguments. The design also allowed the use of detailed follow-up questions on what each writer did on the second letter that he didn't do on the first, and why.

To avoid the misunderstandings observed in Experiment 2, the subjects were allowed to refer to the original two-page briefing sheets while writing their letters. As a further aid, each writer was given a briefing sheet describing both himself - ie.,

the role he was supposed to play - and Mr. Beyer - his identity, the nature of his organization, and his attitude toward the project (Figure 12). An additional, unplanned, memory aid was the fact that the experiment was run during Summer session, when all classes are at least 100 minutes long; thus there was no delay between the end of the briefing procedure and the beginning of the letter-writing. The experiment was organized as follows:

1. The briefing procedure was identical to that used in Experiment 2: the students were given 10-15 minutes to read the same briefing instructions and 10-15 minutes to answer the same set of questions about them (see Figures 1 and 4), after which the experimenter reviewed the answers in class and answered their questions to make sure they understood the task well.

2. Each student was given a copy of Beyer's letter (Figure 2) and a copy of the WHO ARE YOU? - WHO IS MR. BEYER? briefing sheet (Figure 12) and asked to read them carefully.

3. Each student was given lined paper, together with either: 1) the original outline (Figure 6); or 2) a sheet of paper simply telling him to reply to Beyer's letter (Figure 13). All students were then told to write their replies.

4. After everyone had finished, each student was given a copy of Beyer's second letter (Figure 14) and told to answer it.

5. When everyone had done this, the follow-up questionnaires (Figure 15) were handed out and everyone was asked to complete them. This ended the experiment.

The 37 subjects were all Summer school students in lower-level writing courses at CCAC South Campus, the same school used in Experiment 2, and the same kind of students. The three course sections, one of Basic English 2 and two of College English 1, were all taught by the same instructor; the same procedure was used in all sections to balance the design, namely: each section was divided in half on the basis of the students' scores on the Prentiss-Hall Diagnostic Test for Writers, which the instructor had administered at the beginning of the term, and the students in each half were then randomly assigned to one of the two treatment conditions. The

longer class periods allowed much greater persistence in the task - all subjects completed the first letter, and only one failed to complete the second, leaving 18 subjects in each treatment condition.

Results

As we had hoped, both treatments greatly improved the writers' responsiveness to the audience. The removal of the outline, a very general treatment, produced a very general effect: scores on both audience-related issues rose to around 50%. The second letter emphasized the problems of the old system and produced a strong additional increment in performance, but only on that measure.

The Outline as a General Treatment

The answers to the follow-up questionnaire show that the subjects regarded the outline as an extremely important part of the task. Nine of the 18 subjects who had one regarded it as their most useful handout. Even though the two-page briefing sheet had more information, only six writers preferred it, and only one preferred Beyer's letter. Typical reasons given for the outline's usefulness were "it refreshed my memory", "had all the ideas I needed", "it automatically broke down what to write". The utility of outlines in general was affirmed by both groups; 100% of those with the outline and 89% of those without said it was easier to write with an outline than without one.

Thus we might expect the outline to have a strong effect on behavior, as indeed it does. The absence of an outline seems to raise both performance measures to the same modest level, somewhere around 50%. In replying to the first letter, only 22% of the writers with the outline mentioned the old minibus system, as opposed to 56% of the writers without it ($p=.04$ by exact test); only 17% of those with the outline mentioned private ownership, as opposed to 44% of those without it ($p=.07$). Because they can respond properly when the outline is removed, it seems that at least half of the novices must possess the first three components of Flavell's (1974) "role-taking" skill (see Experiment 2, Introduction), but the outline

discourages many of them from applying their knowledge.

The second letter, which does not require the outline, also raised scores on the mention of private ownership to around 50%. Of the writers who started with the outline, 50% responded to this issue in their second letters (17% before vs 50% after, $p<.04$ by exact test); of those who started without the outline, 44% did so (44% before and after). The similarity of all the post-treatment scores, together with the similarity of their underlying conditions - either the absence of an outline (first letter) or the absence of any need for one (second letter) - suggests a single underlying factor, namely that the writers were not using the outline. If so, it would follow that the second letter supplied no effective feedback on the issue of private ownership, since otherwise scores on this issue would have risen beyond the 50% level produced by removing the outline. This conclusion is not unreasonable, given that the second letter did not emphasize the issue, but only mentioned it in passing.

It is interesting to note, by the way, that even without an outline, the novices still lagged behind our original ten experts, 60% of whom mentioned both issues, as opposed to only 28% of the outline-free novices ($p=.10$ by exact test).

The Second Letter as a Specific Treatment

Beyer's second letter had a dramatic impact on both groups of writers. Of those who began with an outline, 72% said this letter was the most important handout they used in writing their second letters; only 6% responded this way to Beyer's first letter ($p<.00005$ by exact test), and only 33% mentioned the first letter at all (72% vs 33%, $p=.02$). Of those who began without an outline, 83% said the second letter was their most important handout; only 28% responded this way to the first letter ($p<.002$), and only 33% mentioned it at all (83% vs 33%, $p<.003$).

The effect on the actual writing was also dramatic. Of those starting with an outline, 72% addressed the problems of the old system in the second letter, compared with only 22% in the first ($p<.004$ by exact test); for those starting without an outline, the scores were 94% vs 56% ($p<.01$).

The difference between 72% and 94% ($p<.09$ by exact test), is in the direction we would expect from the fact that the second letter can improve only the scores of those subjects who failed on the first letter. Thus if we assume that there are no backsliders - ie., people who mentioned the old problems in the first letter but not in the second - then the final score should be:

(% successful on 1st letter) + (% improvement)X(% failed on 1st letter).

Of the 22 writers who failed on the first letter, 17 succeeded on the second, a 77% improvement. Thus the scores of the outline group should go from 22% to (22%) + (77%)X(79%) = 83%, while the non-outline group should rise from 56% to 56% + (77%)X(44%) = 90%. These values fit the data reasonably well, and if we correct for the one backslider, they fit even better, 76% vs 90%.

Interestingly enough, the two treatments had no effect on the subjects' stylistic approach to the audience. In Experiment 1 we found that 70% of the experts personalized their opening paragraphs by making the subject of each predicate either a personal pronoun or a noun phrase modified by a personal pronominal adjective, while only 15% of the novices did this. In the present experiment, only six of the 72 letters written (8%), one or two in each of the four treatment conditions, had such personalized first paragraphs. Thus, even when the novices' concern for audience-related issues approaches that of the experts, the experts still retain a stylistic advantage, possibly due to a greater knowledge of the conventions of style and organization (teachers claim that novices often have trouble with paragraph boundaries, and indeed many of the subjects in this experiment wrote letters consisting of a single paragraph).

Outline vs Strong Letter: a Pilot Study

The above results indicate that the outline lowers responsiveness to both concerns of the audience by focussing attention solely on the topic, while Beyer's second letter increases responsiveness only to the one audience-related issue it emphasizes. It is reasonable to ask, then, how the two treatments interact,

especially since the answer may give us some insight into how novice writers respond to the cues they are given.

The subjects for this study were 11 Basic English 2 students at CCAC South in a later Summer session course taught by the same instructor as above. Because of the shortage of subjects, all were given the same treatment: they were briefed as before (Steps 1 and 2, above), then given copies of the same outline as before, together with a new version of Beyer's second letter (slightly modified to make it read like a first letter; see Figure 16), and then asked to write their replies. All this was done in one class period.

The results, though based on an uncontrolled small sample, are consistent with the pattern we have already discovered. The old system's problems were mentioned by 54% of the writers, a score that lies between the 22% score of those (above) who answered Beyer's weak first letter with the aid of an outline ($p<.09$ by exact test) and the 94% score of those who answered his strong second letter without ever having had an outline ($p<.01$). In this case, the ideas in the outline and the problems of the old system were emphasized but private ownership was not, and its score was only 27% (54% vs 27%, $p<.19$, n.s.).

Although most subjects still compared the new system with the proposed alternative of regular buses, the amount of such comparison was greatly reduced. The average writer copied only 23 words from the outline, compared with 48 words for the average writer who used Beyer's weak letter in the experiment above ($p<.02$, $t(27)=2.70$); the average number of references to outline ideas was 4.7 vs 8.2 ($p<.02$, $t(27)=2.56$). Thus the strong letter seems to reduce the sampling of ideas from the outline by providing an alternative set of strong ideas.

Discussion

The removal of the outline and the addition of Beyer's strong letter each substantially increased the writers' response to their audience. The pattern of results, though complex, might best be explained in terms of three major issues a

writer can address, namely: 1) minibuses are better for the handicapped than regular buses; 2) the new minibus system will be better than the old one; and 3) publicly run minibuses are better than privately run minibuses. The outline provides a framework for addressing the first issue, while Beyer's strong letter provides a framework for the second and/or third. Because the briefing sheets address issue 1, nearly every first letter written addresses it as well; the outline, however, reinforces the point enough so that any other issue must be presented forcefully and in similar detail in order to have a good chance of being included. Thus when Beyer's weak letter was used with the outline, issues 2 and 3 were presented much more weakly than issue 1, and were mostly ignored; when the outline was removed, issues 2 and 3 were each sampled close to 50% of the time. Similarly, when the outline was matched against a strong first letter, nearly all subjects addressed issue 1, but half addressed issue 2 as well. On the second letter, however, issue 1 had been previously disposed of, so the major framework available to the writers was built around issue 2, to which over 80% responded; issue 3, a major point which was only a part of this framework, had only a 50% chance of being used.

We see, then, that novice writers are not really insensitive to their audiences - Experiment 2 shows that they are often well aware of the issues - but they are very context-dependent, relying on the most salient cues to tell them what points to address; furthermore, even under the best conditions their style remains less personal than that of the experts of Experiment 1. The implications of these results will be discussed in the final chapter.

Implications of the Study

Although this study did reveal strong stylistic differences between experts and novices - especially in the personalization of the opening paragraph - the most striking feature of novice writing behavior was an extreme cue-dependency. Thus in Experiment 1 the novices tended to do little more than the minimum each task required, generating ideas with no explicit planning, organizing old ideas without introducing new ones, and relying heavily on the content and wording of the outline to produce their letters. The novices of Experiments 2 and 3 displayed a similarly narrow behavior: they responded strongly to an explicit follow-up letter from Mr. Beyer, but much less strongly to Beyer's weak first letter, even when the outline was removed; and a carefully focussed pre-letter questionnaire had no effect on their performance at all - even though their answers to the questionnaire showed that many of them clearly understood both who Beyer was and how he felt about the project.

What is the source of this cue-dependency? A cognitive overload brought on by a complex task? An attempt to treat the problem as a purely academic exercise? The absence of some very narrow, easily taught skill? Or is cue dependency a manifestation of something deeper, like intelligence, social adjustment, or field dependence?

A simple cognitive load hypothesis might claim that processing the information extracted from the outline - and/or the conversation sheets - takes up so much of short-term memory that not enough room is left to deal with Beyer's concerns. Although there is no logical necessity for such interference - indeed, every writer who did address Beyer's concerns did so in an opening or closing paragraph, separate from all those paragraphs derived from the outline - it is still possible that subjects who focus on the outline/conversation material from the beginning are unable to escape from it.

Another, not necessarily incompatible, hypothesis is that the subjects are deliberately focussing on the most salient cues in an attempt to outguess the

experimenter. Such strategies are often useful in schoolwork, so it would not be surprising if they were used on a test administered in an academic setting. Indeed, Mosenthal's (1979) study raises the possibility that the student's performance on this task may reflect his relationship with his teachers. Thus teacher-dominated students might be expected to respond adequately to Mr. Beyer only when the situation obviously demanded it, eg., in replying to a strong letter with no outline; teacher-cooperative students, more skilled in performing classroom inferences, would be more likely to see what was required in less explicit versions of the task, eg., in replying to Beyer's weak first letter without an outline; and finally, teacher-independent students would probably not even try to figure out what the experimenter wanted, but would either reject the task altogether, or else take their relationship with Mr. Beyer quite seriously, in which case they might respond correctly to even the weakest versions of the task.

But even allowing for "school-wise" behavior, there still remains the likelihood that some of our subjects' performance is due to other kinds of skill. For example, both this study (Experiment 1) and that of Hayes and Flower (1979) showed that expert writers used a far more personal style than did novices. At a higher level, Hayes and Flower also found that experts were much more likely to retrieve audience-related material from memory, which suggests differences in the storage of that information.

Far deeper issues may be involved, however. Among some subjects performance appeared to reflect a deliberate strategy for dealing with the whole world, and not just well-defined classroom writing tasks. Thus one class at CCAC became embroiled in a vigorous (post-experiment) debate over whether the assignment was fair, one side taking the position that Beyer's first letter should have been more precise, the other side claiming that some people really write that way. The first attitude is more than a mere passive dependence on the task environment - it is an insistence that certain social conventions be met, and a refusal to deal with the person who fails to meet them; it reflects not so much a lack of skill in drawing social inferences as a hostility toward the idea of learning how to draw new ones.

The second attitude, on the other hand, manifests what one instructor at CCAC referred to as "savvy", noting it to be her best intuitive predictor of classroom success (Herbert, 1979), though it clearly has applications well beyond the classroom.

How can we investigate these hypotheses? Perhaps the simplest method would be to add interviews and/or questionnaires to the basic writing task. This would at least enable us to study the subjects' attitudes toward personal relationships, both inside and outside the classroom, and might even shed some light on whether performance on the task reflected a conscious strategy.

A more powerful technique would be to have the subjects generate verbal protocols as they write. This would allow us to examine many of their conscious decisions, and we could also conduct a much more detailed interview after the task was completed. Even if the act of talking aloud had a powerful effect on the writers' concern for their audience, this fact in itself would be of great interest, since we still have little knowledge about the interaction between writing behavior and protocol-taking. Our use of a standardized task would allow us to analyze such interactions in detail, comparing performance with protocol-taking to performance without it.

A set of objective measures of attitude, like those used by Mosenthal (1979), would also be useful, but no measures exist which are suitable for our purposes. Mosenthal's categories were designed for 4th graders rather than college students, and most of the response patterns he used to classify his subjects would be regarded as immature in a college student; furthermore, student-teacher conversations are much less frequent in college, making them an uncertain source of data. If we want objective measures, we will have to construct our own, possibly from student responses to homework and tests.

For the long run a much more economical set of tasks will be required. As a test of rhetorical skill our task is far too expensive, yielding only a few pieces of data for nearly an hour's work, and allowing only one version of the task to be used for

each subject. One cure for this problem might be to replace the single writing task with a battery of editing tasks, eg., asking the subjects to insert an opening paragraph in an otherwise complete letter. Such a test battery might have practical applications as well, allowing teachers to assign each student to an appropriate curriculum. For example, even if it should turn out that these tests measure nothing more than classroom attitude, we might still use them to direct the students: teacher-dominated students might require a very carefully shaped curriculum like programmed learning, which teacher-independent students would resent, preferring to tackle realistic problems as soon as possible; and teacher-cooperative students would probably adapt to any curriculum, but might need special instruction to generalize their training for use beyond the classroom.

Even without this information, however, the current study has provided some important clues to what a pedagogy of rhetoric must look like. The failure of Experiment 2 to improve performance should warn us that crude methods of focussing attention on an audience - like priming the student with questions - may not have any effect on the way the student addresses that audience. As Flavell (1974) points out, a writer must not only be aware of the needs of his audience, he must have procedures for translating that knowledge into action, and he must feel the need to apply those procedures. For these reasons we should be reluctant to give such crude methods a major role in any curriculum until much more is known. Indeed, Allwood and Montgomery (1977) found a very similar pattern of results in a completely different domain, the teaching of statistics, which indicates that the weakness of such a pedagogy is by no means peculiar to writing.

On the other hand, the success of the methods of Experiment 3 - ie., the fact that it was possible to find strong versions of the task to which nearly all subjects would respond - suggests that an efficient pedagogy might well be constructed around such carefully chosen tasks. One possible approach might use Terrace's (1963) fading technique: starting with a very well-defined set of problems and then, as the students mastered these, moving on to more complex, less clear situations. In its purest form, such a pedagogy would not directly teach rhetorical

principles at all, but rather would allow the students to form their own generalizations. This is a very conservative approach, and would permit the design of some kind of curriculum - though perhaps not a very efficient one - even in the absence of a good theory of the cognitive skills of rhetoric (eg., by focussing entirely on the finished product).

To the extent that we can discover such skills, however, we would probably prefer to teach them as directly as possible. One way to do this, traditionally favored by many good teachers, is the "Socratic", or case study method: the use of carefully chosen examples - like the strong versions of our task - to illustrate the principles being taught (Collins, 1977). The success of Experiment 3 suggests that the Socratic method may indeed be effective, and that much of that effectiveness may lie in its use of good examples.

Though our results are derived from the classroom, the implications of these results extend to many practical writing situations as well. Much of the world's writing - especially technical writing - is done under conditions very much like those in our experiments: technical writers often have no special expertise in the subjects about which they write and no first-hand knowledge of the audiences for whom they are writing; much of their effort is spent in trying to squeeze a set of ideas supplied by one group of people (eg., designers' specifications) into a standardized framework supplied by another (eg., government standards for manual writing). Thus it is quite possible that poor technical writing has the same cause as poor performance in our tasks: namely, an extreme cue-dependency on the part of the writers.

What should be done about this cue-dependency? Two very different but complementary approaches suggest themselves. One of these involves the design of guidelines for writing; since most practical writing is subject to both technical and social constraints, it is sensible to make these constraints as explicit as possible, so that the writers are not forced to discover the constraints for themselves.

But explicit guidelines are not enough. Any fixed set of guidelines, no matter how

good, cannot really be expected to account for every possible change in technology and every possible audience that a writer might face. At some point we must have knowledge that goes beyond the guidelines; at some point we must have real rhetorical skill, and real writers.

How can we get them? I have already indicated two approaches to training writers in audience awareness; the problem of document design within a large organization suggests a third possibility, involving on-the-job training. Such an approach might combine the training of writers with a careful structuring of the writing staff's activities, so that education could be done on the job without interfering with the organization's production. Thus the manager of a writing staff might be a writer who has been promoted because of his overall competence, ie., his ability to master the larger aspects of the subjects about which he writes; his job as manager would be to define the important features of each problem for his subordinates, who would do the actual writing. In this way the manager could accomplish his primary task - getting the writing done - while training his writers to handle more and more difficult assignments - including eventually his own job.

These are still speculations, of course; we did not study learning, and our results are not enough to found either a new pedagogy of rhetoric or a new theory of management. Nonetheless, we have made a beginning in both areas, and in the measurement of writing skill as well. Our experiments have clearly shown the value of knowledge-controlled testing, high-level models, and developmental techniques in studying this area: By using a test where background knowledge was carefully controlled, we were able to establish strong differences in writing behavior, in particular that unskilled writers are far less likely than skilled writers to respond adequately to the concerns of their readers. By using a detailed questionnaire we were able to show that this difference remains even when the unskilled writers understand both the readers and their concerns quite clearly. By using this same questionnaire as an instructional aid, we found that focussing the writer's attention on the relevant issues is unlikely by itself to improve performance. And finally, by manipulating the task environment - the presence or absence of the outline, the

strength of the letter being answered - we found that the unskilled writer's apparent insensitivity to his audience is due mainly to an extreme dependence on context, a reliance on only the strongest cues for information about what to write.

The success of this study in isolating and investigating a small but comparatively well-defined part of rhetorical understanding suggests that methods similar to ours may be useful in studying other problems in the acquisition of complex skills. In any case, the answers we have obtained and the further questions we have raised provide a partial map of an only poorly explored territory, a map we hope will usefully guide future exploration.

References

Allwood, C.-M. and Montgomery, H. Detection of errors in statistical problem solving. Goteborg Psychological Reports, No. 9, Vol. 7, 1977.

Baker, S. The practical stylist. New York: Thomas Y. Crowell Company, 1973.

Berlin, J.A. and Inkster, R.P. Current-traditional rhetoric: paradigm and practice. Unpublished MS.,1979.

Bond, S.J. and Hayes, J.R. A review and discussion of tests of writing ability. Unpublished MS., 1979.

Braddock, R. Evaluation of writing tests. In: A.H. Grommon (Ed.), Review of selected published tests in English. Urbana, Ill.: National Council of Teachers of English, 1976, 118-126.

Britton, J., Burgess, T., Martin, N., McLeod, A., Rosen, H. The development of writing abilities (11-18). Urbana,Ill.: National Council of Teachers of English, 1975.

Christensen, F. Notes toward a new rhetoric. New York: Harper and Row, 1967.

Collins, A. Processes in acquiring knowledge. In: R.C. Anderson, R.J. Spiro, and W.E. Montague (Eds.), Schooling and the acquisition of knowledge. Hillsdale, N.J.: Lawrence Erlbaum Associates, 1977.

Cooper, C.R. and Odell, L. Evaluating writing: describing, measuring, judging. Urbana, Ill.: National Council of Teachers of English, 1977.

D'Angelo, F. A generative rhetoric of the essay. College Composition and Communication, 1974, 25, 388-396.

Emig, J. The composing process of twelfth graders. Urbana, Ill.: National Council of Teachers of English, 1971.

Fagan, W.T., Cooper, C.R., and Jensen, J.M. Measures for evaluation and research in the English language arts. Urbana, Ill.: National Council of Teachers of English, 1975.

Flavell, J.H. The development of inferences about others. In: T. Mischel (Ed.), Understanding other persons. Oxford: Basil Blackwell, 1974.

Flower, L.S. and Hayes, J.R. Problem solving strategies and the writing process. College English, 1977, 39(4), 449-461.

Flower, L.S. and Hayes, J.R. Plans and the cognitive process of writing. In: C. Frederickson, M. Whiteman, and J. Dominic (Eds.), Writing: the nature, development, and teaching of written communication. Hillsdale, N.J.: Lawrence Erlbaum Associates, in press.

Flower, L.S. and Hayes, J.R. Cognition of discovery: defining a a rhetorical problem. College Composition and Communication, 1980, 31(1).

Gelman, R. Conservation acquisition: a problem of learning to attend to relevant attributes. Journal of Experimental Child Psychology, 1969, 7(2), 167-187.

Glucksberg, S., Krauss, R., and Higgins, E.T. The development of referential communication skills. In: F.D. Horowitz (Ed.), Review of child development research (Vol. 4). Chicago: University of Chicago Press, 1975.

Gould, J.D. An experimental study of writing, dictating, and speaking. IBM Research Report RC 6186 (#26591). Yorktown Heights, N.Y., 1976.

Gould, J.D. How experts dictate. IBM Research Report RC 6573 (#28373). Yorktown Heights, N.Y., 1977.

Gould, J.D. and Boies, S.J. Writing, dictating, and speaking letters. IBM Research Report RC 6683 (#28698). Yorktown Heights, N.Y., 1977.

Graves, D.H. An examination of the writing processes of seven year old children. Research in the Teaching of English, 1975, 9(3), 227-241.

Hairston, M. A contemporary rhetoric. Boston: Houghton Mifflin Company, 1974.

Hayes, J.R. and Flower, L.S. Protocol analysis of writing processes. Paper presented at the Annual Meeting of the American Educational Research Association, 1978.

Hayes, J.R. and Flower, L.S. Writing as problem solving. Paper presented at the Annual Meeting of the American Educational Research Association, 1979.

Hayes, J.R. and Flower, L.S. Identifying the organization of writing processes. In: L.W. Gregg and E.R. Steinberg (Eds.), Cognitive processes in writing. Hillsdale, N.J.: Lawrence Erlbaum Associates, in press.

Herbert, M.A. Personal communication, 1979.

Hunt, Kellogg W. Grammatical structures written at three grade levels. Urbana, Ill.:

National Council of Teachers of English, 1965.

Kintsch, W. and Vipond, D. Reading comprehension and readability in education practice and psychological theory. Paper presented at the Conference on Memory, University of Uppsala, June, 1977. In: L.-G. Nilsson (Ed.), Proceedings of the Conference on Memory at Uppsala. Hillsdale, N.J.: Lawrence Erlbaum Associates, in press.

Kuhn, D. Inducing development experimentally; comments on a research paradigm. Developmental Psychology, 1975, 10, 590-600.

Labov, W. Language in the inner city: studies in the Black English vernacular. Philadelphia, Pa.: University of Pennsylvania Press, 1972.

Larson, R.L. Toward a linear rhetoric of the essay. College Composition and Communication, 1971, 22, 140-146.

Mosenthal, P. Student-teacher interactions and their effects on children's written discourse. Paper presented at the Annual Meeting of the American Educational Research Association, 1979.

Mellon, J.C. Transformational sentence-combining: a method for enhancing the development of syntactic fluency in English composition. Research Report no. 10. Urbana, Ill.: National Council of Teachers of English, 1969.

Nelson, W., Petelle, J.L., and Monroe, C. A revised strategy for idea generation in small group decision making. Speech Teacher, 1974, XXIII(3), 191-196.

Newell, A. and Simon, H.A. Human problem solving. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1972.

O'Hare, F. Sentence-combining: improving student writing without formal grammar instruction. Research Report no. 15. Urbana, Ill.: National Council of Teachers of English, 1973.

Perl, S. Five writers writing: case studies of unskilled college writers. (Doctoral dissertation, New York University) 1978.

Pike, K.L. A linguistic contribution to composition. College Composition and Communication, 1964, 15, 82-88.

Pike, K.L. and Pike, E.G. Grammatical analysis. Austin, Texas: Summer Institute of Linguistics, 1977.

Rentel, V.M., King, M., and Pappas, C.C. Toward a theory of early writing development. Paper presented at the Annual Meeting of the American Educational Research Association, 1979.

Scardamalia, M. How children cope with the cognitive demands of writing. In: C. Frederickson, M. Whiteman, and J. Dominic (Eds.), Writing: the nature, development, and teaching of written communication. Hillsdale, N.J.: Lawrence Erlbaum Associates, in press.

Scardamalia, M., Bereiter, C., and McDonald, J.D.S. Role-taking in written communication investigated by manipulating anticipatory knowledge. Paper presented at the Biennial Meeting of the Society for Research in Child Development, March, 1977.

Scardamalia, M., Bracewell, R.J., and Bereiter, C. Writing and decentered thought: the development of audience awareness. Paper presented at the Annual Meeting of the American Educational Research Association, 1978.

Shaughnessy, M.P. Errors and expectations. New York: Oxford University Press, 1977.

Sommers, N.I. Revision strategies of student writers and inexperienced writers. Paper presented at the Annual Meeting of the Modern Language Association, 1978.

Stallard, C.K. An analysis of the writing behavior of good student writers. Research in the Teaching of English, 1975, 8, 206-218.

Terrace, H.S. Discrimination learning with and without "errors". Journal of the Experimental Analysis of Behavior, 1963, 6, 1-27.

Winterowd, W.R. The grammar of coherence. College English, 1970, 31, 828-835.

Young, R.E. Paradigms and problems: needed research in rhetorical invention. In: C.R. Cooper and L. Odell (Eds.), Research on composing: points of departure. Urbana, Ill.: National Council of Teachers of English, 1978, 29-48.

Materials for Experiment 1

A WRITING PROBLEM

Your name is John Carmody, and you are the president of Urban Systems Design, a small consulting firm. Your firm has been hired by the city of Pittsburgh to evaluate its transportation system, and one of your projects is to reorganize the city's transportation of the handicapped. The people working on this project have already decided that a system of minibuses would be the city's best choice, but they have not yet written up their final proposal. In the next week you will have to write letters to various people explaining this proposal; you are now talking with the leader of the project to get the necessary information:

You: Harry, can you give me a few minutes?

Project Leader: Sure thing, John. What do you have in mind?

Y: I know your group's proposal won't be in final polished form for another month, but I've got to start talking to people about it this week. Can you answer some questions about what you've decided so far?

PL: Shoot.

Y: I understand that you looked at the option of installing power lifts on regular public buses so that handicapped people could avoid climbing stairs, and you rejected that option in favor of sending special minibuses to the homes of the handicapped individuals.

PL: Yes, that's right. The cost is about the same, and the minibus system is more convenient.

Y: I understood that the Bell agency's figures showed minibusing to be more expensive.

PL: Not by that much. Their figures say that it's 4 percent more expensive, Jack Riley's figures say it's 3 percent cheaper. Doesn't mean anything either way. You

can't get better than 10 percent accuracy on these estimates anyway.

Y: Really? I'm surprised. I would have thought hiring a fleet of minibuses would be much more expensive.

PL: Well, remember that if you want to cover any reasonable part of the city with powerlifts, you've got to install the lifts in about one out of every three regular public buses. Now at ten thousand dollars per lift, plus maintainance, plus the salary of the guys who operate the lifts...

Y: Why can't the bus driver operate the lift?

PL: State law. The lift operator must be specially trained. You train the bus driver, then you've got to pay him an extra salary.

Y: I get the picture. Ok, now why do you say minibusing is more convenient?

PL: Well, first off, it's more convenient for all the non-handicapped. It takes at least thirty seconds per person to operate a powerlift, which creates delays, which upsets the bus schedules.

Y: Thirty seconds isn't that much. I would think it would only be a problem if the handicapped travel in groups.

PL: Well, for most areas you're probably right, but some places, like Oakland, where all the hospitals are, are going to create bottlenecks.

Y: How about the handicapped themselves? How convenient is minibusing for them?

PL: Pretty good, I think. Many of them are so badly handicapped that they can't get to a public bus stop at all without help. The minibus picks them up at their homes and delivers them right to their destinations. Also, you have to remember that Pittsburgh is a difficult place for the handicapped to get around in - it's very hilly, and once you get away from the shopping areas, the bus stops are not that close

together.

Y: Surely a regular bus driver doesn't have to stop only at the official bus stops.

PL: No he doesn't, but many streets have no bus service at all, so that's still a problem.

Y: Yes, I see. What about waiting time? How long does a rider have to wait for a bus?

PL: Well, with the minibuses you have to phone the bus company to make arrangements. The best way to use this system is to have the user call a day in advance, since the city can't afford enough buses to run them like a taxi service.

Y: What if the user needed a bus the same day?

PL: It could probably be arranged, but he might have to wait several hours.

Y: So then in this case the regular bus system has the advantage. PL: Well, yes and no. The city can't afford to put lifts in more than a third of its buses, which means that a handicapped rider can only use every third bus. In most areas, this means a wait of an hour or two. And of course, public buses don't wait for passengers who aren't there - if you miss the bus, you just wait some more. And of course, if a bus breaks down, they usually don't have another one to take its place. So you have to wait for the next one. And meanwhile, you're doing all this waiting on a street corner instead of at home.

Y: Good. I think I've got enough now to get me through the week. Thanks for your time.

Figure 1: Briefing Conversation

Mr. Raymond G. Beyer, Chairman
Handicapped Citizens of Greater Pittsburg
221a S. Craig St.
Pittsburgh, Pa. 15213

Mr. John Carmody, President
Urban Systems Design
1033 Commonwealth Ave.
Cambridge, Mass. 01719

Dear Mr. Carmody:

For many years, our organization has campaigned to improve Pittsburgh's public transportation of the handicapped; in the past, the only special transportation available here has been in the form of a few privately owned minibus services, some of which were very badly run. Now that Pittsburgh is redesigning its transit system, many of the handicapped people we talk with are afraid the city will adopt a system of these minibuses. Since your firm is actually designing the new system, I thought it reasonable to let you know our feelings, to invite you to consult with us at any time, and to ask you to please keep us informed.

Sincerely Yours,
Raymond G. Beyer

Figure 2: Beyer's Letter

PART 1

Make a list of all the ideas you think it might be useful to include in your letter; when you are done, put a check mark next to the ideas you think are worth keeping.

Figure 3: The Idea-Generation Task

Two systems of transporting the handicapped are being compared - one is a fleet of special minibuses which only the handicapped will use; the other is to install powerlifts on some of the regular public buses, which everyone will use.

Answer each of the following questions in a few words:

1. Which system are you going to propose?
2. Which system costs more?
3. If powerlifts are used, how many regular buses will have them?
4. Which system is more convenient for the non-handicapped?
5. Where do you wait for a minibus? For a regular bus?
6. How do you get a ride on a minibus? On a regular bus?
7. How long do you have to wait for a minibus? For a regular bus?

Figure 4: Questionnaire Given to Standardize All Subjects' Knowledge

PART 2

The following are some of the important ideas covered in your discussion of the busing project with the project leader. Cross out the numbers of the items you think are not worth putting in your letter. Then, in your own words, write a brief sentence or two summarizing the main points you want to make in your letter. For each point, write down one or two (or three) ideas that will help you make the point (you may copy the sentence numbers, or put the ideas in your own words, or make up new ideas). The final result might look like this example:

Main Point 1

idea 1

idea 2

idea 3

Main Point 2

idea 4

idea 5

1. The city can't afford enough minibuses to run them like taxis.

2. The city can't afford to put lifts in more than a third of its regular buses.

3. Pittsburgh is very hilly.

4. A rider has to wait for a regular bus on a street corner instead of at home.

5. A powerlift operator must be specially trained.

6. Regular buses won't wait for handicapped riders who are late.

7. If a regular bus breaks down, PAT usually can't send a replacement, so the rider has to wait for the next bus.

8. Regular bus drivers can stop for the handicapped anywhere on their routes, not just at the regular bus stops.

9. Both cost estimates are within a 10 percent margin of error, so the costs of the two systems are essentially the same.

10. If there are many handicapped people along a regular bus route, buses may be greatly delayed by picking them up.

11. Severely handicapped people will have trouble even getting to a regular bus stop.

12. In most areas, a rider will have to wait an hour or two for a regular bus with a lift.

13. To use a minibus, it is best to phone the bus company a day in advance to make arrangements.

14. Minibusing takes the user door-to-door, so he doesn't have to wait at a bus stop.

15. If you want to use a minibus the same day you call for it, you may have to wait several hours.

16. Two competing systems for transporting handicapped people are being compared - special minibuses just for the handicapped, versus regular PAT buses equipped with powerlifts; the design group prefers minibusing.

17. To get reasonable coverage of the city with powerlift-equipped buses, the lifts must be installed in at least one-third of all regular PAT buses.

18. If powerlifts are used, a handicapped rider will only be able to use every third bus.

19. Handicapped people tend to be concentrated in places like Oakland, where

the hospitals are, so these areas may be bottlenecks in regular bus transportation if lifts are used.

20. If a regular bus driver operates a lift, he must be paid an extra salary.

21. Outside of the shopping areas, regular bus stops are not close together.

22. Jack Riley says minibusing is 3 percent cheaper than installing powerlifts.

23. Each powerlift costs $10,000 to install, and costs money to maintain.

24. Many streets have no regular bus service.

25. Pittsburgh is hard for the handicapped to get around in without motorized transportation.

26. Operating a lift takes at least 30 seconds per person.

27. The Bell agency says minibusing is 4 percent more expensive than powerlift busing.

Figure 5: The Idea-Organization Task

PART 3

Write the actual letter, using the following outline as a starting point (you may add or remove whatever ideas you wish) :

Main theme: The minibus system is more convenient for the handicapped.

Supporting evidence:

- 1) door-to-door service vs waiting on the street
    - * a) severely handicapped people will have trouble getting to regular bus stops without help
    - * b) bus stops are often far apart, and many streets are not served at all
- 2) the rigidity of regular bus schedules is a nuisance
    - * a) lift-equipped buses will only run every hour or two
    - * b) regular buses won't wait for handicapped riders who are late
    - * c) if a regular bus breaks down, PAT usually can't send a replacement, so the rider has to wait

Figure 6: Outline for the Translation Task

SCORING BEYER'S LETTER

one point for each of the following:

1. mentioning the letter itself (eg., "your letter", "your communication", or some mention of the fact that Beyer made contact before)
2. mentioning Beyer's organization (eg., "your organization")
3. Beyer's organization has campaigned to improve Pittsburgh's transportation of the handicapped
4. Pittsburgh's current minibuses are privately owned
5. many of Pittsburgh's minibuses were badly run
6. many handicapped people are afraid the city will adopt a system of minibuses
7. invitation to ask questions (eg., "If you have any questions, feel free to write.")
8. promise to contact Beyer (eg., "a member of our firm will call you later this week")

Note: since item 8 implies item 7, anyone who responded to item 8 was scored as having responded to item 7 as well

Figure 7: Rules for Scoring of Writer Responses to Beyer's Letter

RATING INSTRUCTIONS

Some of the business letters I have given you were written by people who have had very little experience in writing; some of these letters were written by people who have had a great deal of experience in writing. All of the letters are rough drafts, not finished works; I have corrected the spelling and punctuation errors myself, and typed the letters in a standard format.

Please read the letters and try to decide which ones were written by "experts" and which ones were written by "novices" - write EXPERT or NOVICE at the top of each letter. Also, please answer each of the following questions:

1. How well does the writer use language? ((a) very well, (b) moderately well, (c) only fair, (d) poorly)

2. How coherent is the letter? ((a) very, (b) moderately, (c) a little disorganized, (d) very disorganized)

3. How well does the writer explain and develop his ideas? ((a) very well, (b) moderately well, (c) only fair, (d) poorly)

4. How effective is the letter given this situation? ((a) very, (b) moderately, (c) only slightly, (d) not at all)

5. What is your overall impression of the writer as a person? ((a) very positive, (b) positive, (c) neutral, (d) negative, (e) very negative)

Figure 8: Instruction Sheet Given to Holistic Raters

Holistic Rating Scores

		Rater 1	Rater 2	Rater 3	Rater 4	Mean
% of subjects called expert	Experts:	40**	90	70	60	65.0
	Novices:	0	10	0	0	2.5
language use	Experts:	3.5	3.0***	3.5	3.1*	3.3
	Novices:	2.4	2.2	2.1	2.4	2.3
coherence	Experts:	3.4	3.0	3.5	3.2	3.3
	Novices:	2.0	2.3	1.8	2.2	2.1
explanation and development	Experts:	2.9	3.0	3.5	3.0	3.1
	Novices:	1.5	1.4	1.7	1.3	1.5
effectiveness	Experts:	2.7	2.8	3.1	2.9	2.9
	Novices:	1.5	1.8	1.5	1.5	1.6
personal impression	Experts:	3.4	3.8	3.8	3.5	3.6
	Novices:	2.4	2.8	2.3	2.1	2.4

* p<.15 by t-test, 2-sided
** p=.043 by 1-sided exact test; for all other differences in this row, p<.006 by exact test
*** p<.02 by t-test; for all other differences in this table, p<.01 by t-test

Figure 9: Mean Holistic Ratings of 10 Novices and 10 Experts

Additional Materials for Experiment 2

Questionnaire for Experiment 2

Page 1:

Imagine that you are going to have a face-to-face meeting with Mr. Beyer one hour from now. Write down a list of questions that you might want to ask him:

Page 2:

What do you think is Mr. Beyer's attitude toward you? Why do you think so?

What do you think is Mr. Beyer's attitude toward the new minibus system? Why do you think so?

Page 3:

What will Mr. Beyer like most about the new system of minibuses?

What will Mr. Beyer dislike most about the new system of minibuses?

What can you do to make Mr. Beyer feel better about the new system?

Page 4:

What features should the new minibus system have that would make Mr. Beyer feel better about it?

Figure 10: Treatment/Inquiry Questionnaire for Experiment 2

Homework Assignment

1. What was hard about the assignment? If you found much of it hard, what gave you the most trouble? Why was it hard?

2. Was there anything you didn't understand? What? What was confusing about it?

3. Was there anything you did not like about this assignment? What? Why?

4. What did you think the experimenter wanted to find out? List anything you can.

Figure 11: Follow-up Questionnaire for Experiment 2

Additional Materials for Experiment 3

WHO ARE YOU?

You are John Carmody, the president of Urban Systems Design. Your firm has been hired by the city of Pittsburgh to design a system for transporting the city's handicapped people. You are going to propose a system of minibuses.

WHO IS MR. BEYER?

Mr. Beyer is the chairman of Handicapped Citizens of Greater Pittsburgh, which is a small political group (about 50 members) which lobbies for the interests of handicapped people in Pittsburgh. Nearly all of its members - including Mr. Beyer - are handicapped themselves. Many of them are against any kind of minibus service.

Figure 12: Role/Attitude Briefing for All Subjects

Write a letter replying to Mr. Beyer. Feel free to look at any of the briefing sheets if you need to.

Please write your letter on lined paper, not on this sheet. If you need any more paper, just ask for it.

Figure 13: Instruction Sheet for Subjects with no Outline

Mr. Raymond G. Beyer, Chairman
Handicapped Citizens of Greater Pittsburg
221a S. Craig St.
Pittsburgh, Pa. 15213

Mr. John Carmody, President
Urban Systems Design
1033 Commonwealth Ave.
Cambridge, Mass. 01719

Dear Mr. Carmody:

Thank you for answering my letter so promptly. Although I can understand your reasons for recommending a system of minibuses as a solution to our problems, I am still unhappy about this proposal. What worries me most is that we have already had minibus systems in Pittsburgh, and they have worked very badly. From 1965 to 1973 a few private firms supplied minibus transportation to selected groups of handicapped people here. Each firm had only a few buses, and these buses broke down frequently, leaving passengers stranded miles from their homes; once a bus broke down, many handicapped people would be without service until it was fixed, and this usually took several days.

Many of the city's handicapped have had very bad experiences with these buses, and they will strongly oppose any new system that threatens them with the same old problems. I urge you to consider these problems carefully before you make your final proposal.

Sincerely Yours,
Raymond G. Beyer

Figure 14: Beyer's Response to the Writer's First Letter

page 1:

The purpose of the following questions is to find out as much as possible about what you were actually thinking when you wrote your two letters to Mr. Beyer. Please answer these questions in as much detail as you possibly can (don't worry about spelling and grammar - the important thing is to tell as much as possible about what you were doing):

1) What did you find most useful in helping you to answer Mr. Beyer's FIRST letter - the conversation sheets, the WHO-ARE-YOU sheet, the outline, or Beyer's letter itself? Why was it useful?

2) What did you find most useful in helping you to answer Mr. Beyer's SECOND letter - the conversation sheets, the WHO-ARE-YOU sheet, the outline, or Beyer's letter itself? Why was it useful?

page 2:

3) Do you think it is easier to write a letter with or without an outline? Why?

4) What is the most important sentence in Mr. Beyer's FIRST letter? Why?

page 3:

5) Was there anything in Mr. Beyer's SECOND letter that surprised you? If so, what? Why were you surprised?

6) Why should you (Mr. Carmody) answer Mr. Beyer's letter at all - why not just ignore it altogether? Is there anything you want from Mr. Beyer?

page 4:

7) In both of his letters, Mr. Beyer mentioned that Pittsburgh's handicapped people had trouble with minibuses in the past. How did you handle this problem in your reply to Beyer's FIRST letter? (If you DIDN'T mention the problem in your letter,

explain why not; what did you do instead?; why? If you DID mention the problem, explain what you did and why you did it.)

page 5:

8) Mr. Beyer's SECOND letter also complained about past minibus troubles. How did you handle this problem in your reply? (If you DIDN'T mention the problem in your letter, explain why not; what did you do instead?; why? If you DID mention the problem, explain what you did and why you did it.)

Figure 15: Follow-up Questionnaire

Mr. Raymond G. Beyer, Chairman
Handicapped Citizens of Greater Pittsburg
221a S. Craig St.
Pittsburgh, Pa. 15213

Mr. John Carmody, President
Urban Systems Design
1033 Commonwealth Ave.
Cambridge, Mass. 01719

Dear Mr. Carmody:

For many years, our organization has campaigned to improve Pittsburgh's public transportation of the handicapped. Now that Pittsburgh is redesigning its transit system, many of the handicapped people we talk with are afraid the city will adopt a system of minibuses. What worries us most is that we have already had minibus systems in Pittsburgh, and they have worked very badly. From 1965 to 1973 a few private firms supplied minibus transportation to selected groups of handicapped people here. Each firm had only a few buses, and these buses broke down frequently, leaving passengers stranded miles from their homes; once a bus broke down, many handicapped people would be without service until it was fixed, and this usually took several days.

Many of the city's handicapped have had very bad experiences with these buses, and they will strongly oppose any new system that threatens them with the same old problems. Since your firm is actually designing the new system, I urge you to consider these problems carefully before you make your final proposal.

Sincerely Yours,
Raymond G. Beyer

Figure 16: Strong Version of Beyer's First Letter

Sample Letters

The following letters were all written for Experiment 1. They have been put in a standard format, with errors in grammar and spelling corrected, so that they could be rated holistically.

Sample Letters Written by Mimics

Mr. John Carmody, President
Urban Systems Design
1033 Commonwealth Ave.
Cambridge, Mass. 01719

Mr. Raymond G. Beyer, Chairman
Handicapped Citizens of Greater Pittsburgh
221a S. Craig St.
Pittsburgh, Pa. 15213

Dear Mr. Beyer:

I must tell you that I am in favor of using the minibus service. The only other alternative would be to install power lifts into PAT buses. It would be very difficult for a handicapped person to get to a bus stop and bus stops are often far apart. Due to the cost only one out of three buses could be equipped with a lift. These buses would only run every hour or two. If a bus breaks down the rider has to wait and if the rider is late he/she has to wait. Minibuses offer the convenience of door-to-door service. Any waiting would take place in the home and would not be nearly as long. I assure you this minibus system will be much more efficient. I will keep you informed of any new developments concerning this issue.

Sincerely Yours,
John Carmody

Mr. John Carmody, President
Urban Systems Design
1033 Commonwealth Ave.
Cambridge, Mass. 01719

Mr. Raymond G. Beyer, Chairman
Handicapped Citizens of Greater Pittsburgh
221a S. Craig St.
Pittsburgh, Pa. 15213

Dear Mr. Beyer:

This is a reply to the letter you sent me. I see that you are worried about minibuses. We are going to adopt minibus for the following reasons:

1. There will be door-to-door service so the handicapped individual can wait in the comfort of his or her own home rather than on a street corner

2. It is also hard for a handicapped individual to get to bus stops since they are far apart and some streets don't have stops at all.

3. If we were to use buses only one in every three would have a lift, so they would only run every hour or two.

4. If someone is late the bus doesn't wait for them, and if they break down PAT won't be able to send a replacement, so the handicapped person has to wait for another bus that is equipped with a lift.

5. Minibuses will be specially equipped for the needs of the handicapped and the driver will be specially trained in case of emergency.

One other point I would like to make is that it would cost the same to put the lifts in as it would for the minibuses, so money is not an influencing factor here.

I hope this letter can convince you that minibuses are the better choice. If you wish to discuss it further please feel free to contact me at any time.

Mr. John Carmody, President
Urban Systems Design
1033 Commonwealth Ave.
Cambridge, Mass. 01719

Mr. Raymond G. Beyer, Chairman
Handicapped Citizens of Greater Pittsburgh
221a S. Craig St.
Pittsburgh, Pa. 15213

Dear Mr. Beyer:

As a reply to your letter, I am writing this letter to keep you informed the transportation for the handicapped problem. My firm, which is designing the new systems, has found that the minibus system is more convenient for the handicapped than the power-lift system. This conclusion has been made after much research.

Our research has found that the minibus door-to-door service is much more convenient than waiting on the street. Bus stops are often far apart, and many streets are not served at all. Also, severely handicapped people will have trouble getting to regular bus stops without help.

Research by our firm has also found out that the rigidity of regular bus schedules is a nuisance to a handicapped person. Lift-equipped buses will only run every hour or two and regular buses won't wait for handicapped riders who are late. If a regular bus breaks down, PAT usually can't send a replacement, so the rider has to wait.

Mr. Beyer, in your previous letter you stated that many of the handicapped people that you have talked with are against the minibus. After reading this letter you should see that the minibus project is actually better than the lift project. As Chairman of the Handicapped Citizens of Greater Pittsburgh, you should convince these handicapped people that the minibus system is superior to the lift system.

Sincerely Yours,

John Carmody

Sample Letters Written by Non-Mimics

Mr. John Carmody, President
Urban Systems Design
1033 Commonwealth Ave.
Cambridge, Mass. 01719

Mr. Raymond G. Beyer, Chairman
Handicapped Citizens of Greater Pittsburgh
221a S. Craig St.
Pittsburgh, Pa. 15213

Dear Mr. Beyer:

Thank you for letting me know how the handicapped citizens feel about the minibuses. It seems that the only reason why they were dissatisfied with the proposal to use public minibuses is that the private minibuses were not reliable. If the system works, it will be more convenient and I am reasonably sure that the handicapped would be pleased with it.

The minibus will pick up a handicapped person wherever he chooses. If the power lift were used on the regular buses, the person would have to go to a bus stop which could be far from where he is. When the person gets there he may have to wait up to two hours for a bus to come. If a bus with a power lift breaks down, the wait could be even longer. For the handicapped person the minibus definitely saves time. The minibus will wait if the person is late whereas the regular bus won't. Hopefully you agree with the convenience of the minibuses. If you have any suggestions feel free to contact Urban Systems Design.

Sincerely Yours,
John Carmody

Mr. John Carmody, President
Urban Systems Design
1033 Commonwealth Ave.
Cambridge, Mass. 01719

Mr. Raymond G. Beyer, Chairman
Handicapped Citizens of Greater Pittsburgh
221a S. Craig St.
Pittsburgh, Pa. 15213

Dear Mr. Beyer:

What we have here is two competing issues on handicapped busing - a fleet of minibuses which will have door-to-door service, or regular PAT buses equipped with special power lifts which will or can be used by the entire population - we have decided that minibuses are better suited for the handicapped.

Severely handicapped people have an extreme problem getting to the station without help; some can't. Therefore, minibuses arriving at home make more sense. If a person arrives late, the driver isn't going to wait.

Schedules would be severely hampered if the power lifts were installed. It takes thirty seconds to load a handicapped person.

Many bus stops are often far apart. When one gets out in the rural sections of town, he may never find a station. Or if he lives in suburbia he will have difficulty.

Since the budget of Pittsburgh only enables one-third of the regular buses to be equipped with power lifts, a person may have to wait one or two hours before the appropriate bus arrives. The lift costs $10,000, and a specially trained operator is required, which implies extra salary expense.

A fleet of minibuses will operate and stress on the convenience of the disabled. The minibuses are equal to the cost of the regular buses, equipped with lifts. If the

person calls 24 hours in advance the bus will arrive on time. However, the buses don't operate on a "taxi-type" system, and, therefore, if one calls without notice he may have to wait several hours.

We at Urban Systems Design feel that minibuses will be more organized than they are presently, and above all more personalized for the handicapped.

Sincerely Yours,
John Carmody

Mr. John Carmody, President
Urban Systems Design
1033 Commonwealth Ave.
Cambridge, Mass. 01719

Mr. Raymond G. Beyer, Chairman
Handicapped Citizens of Greater Pittsburgh
221a S. Craig St.
Pittsburgh, Pa. 15213

Dear Mr. Beyer:

I am writing in response to the letter I received from you a few days ago, concerning the new transit system my company is designing is designing for the city of Pittsburgh. We feel that our new system will satisfy your organization's concern for improved transportation for the handicapped people of your area.

Through intensive research and study, we have come up with the solution of a new minibus system for your area, one that will be far more convenient for the transportation of your city's handicapped than the regular system in operation at the present. We ruled out the possibility of putting hydraulic lifts on the regular buses for two reasons. One, the costs were so expensive that we could only modify about one-third of the buses, and that would not adequately serve the handicapped public. We also concluded that, even with these new lifts, regular bus transportation would still be inadequate for handicapped people, because of their inability to get to local bus stops, and the problems that arise once they get there.

Our minibus system is far more convenient because it is based on door-to-door service, and the schedule for usage is made on an appointment basis. Therefore, there are no problems such as time, inability to get transportation, or destination worries. This gives the handicapped a sense of security, convenience, and safety, without costing extra time, money, or worry.

I hope you will consider the plans I have just described, and I also hope that they

satisfy the goals of your organization. Please respond to my letter, and if you have any ideas that I failed to mention, please include them in your reply.

Sincerely Yours,
John Carmody

Sample Letters Written by Experts

Mr. John Carmody, President
Urban Systems Design
1033 Commonwealth Ave.
Cambridge, Mass. 01719

Mr. Raymond G. Beyer, Chairman
Handicapped Citizens of Greater Pittsburgh
221a S. Craig St.
Pittsburgh, Pa. 15213

Dear Mr. Beyer:

Thank you for your letter of October 16. We are delighted to receive information and ideas from interested citizens' groups such as your own.

We completely agree with your group's contention that the existing system of privately owned minibus services is inefficient and unsatisfactory. Our study has turned up two possible alternatives to that system: (1) a centralized, computer-dispatched system of minibuses and (2) the installation of mechanical lifts on some regular PAT buses. Frankly, our study has indicated that the minibus system would better serve the needs of handicapped persons in Pittsburgh.

A well-run minibus service can provide door-to-door service for any handicapped person in the city. There are, as you know, many handicapped persons who live quite far away from a bus stop, and some severely handicapped persons who would find it very difficult to get to a bus stop at all. Furthermore, since it is not feasible to install lifts on more than about one-third of the regular buses, handicapped persons would often have to wait one to two hours for a lift-equipped bus. The wait might be even longer if a lift-equipped bus were to break down, because the replacement bus would probably lack a lift.

I think that when your group considers all these disadvantages of the alternative, it will agree with us that a well-run minibus system is the most practical way of meeting the transportation needs of Pittsburgh's handicapped citizens.

Mr. Barnes, the member of our staff who is directing this study, will be in Pittsburgh next week. He will be getting in touch with your office to make an appointment to go over our findings with you and answer any questions your group may have.

Sincerely Yours,
John Carmody

Mr. John Carmody, President
Urban Systems Design
1033 Commonwealth Ave.
Cambridge, Mass. 01719

Mr. Raymond G. Beyer, Chairman
Handicapped Citizens of Greater Pittsburgh
221a S. Craig St.
Pittsburgh, Pa. 15213

Dear Mr. Beyer:

I am sorry not to have answered your letter immediately, but I wanted to wait until we had received an analysis of both the minibus and the public bus systems for the handicapped. Today, Mr. Barnes, our Project Leader, brought me his analysis and, although his final report will not be ready for another week, I wanted to let you know at once what we have found out.

Our analysts have compared the minibus system with the public bus system (with the addition, of course, of lifts for the handicapped) in terms of costs and convenience. Although at least one report concludes that the minibus system will cost more, that difference in cost was, in our minds, far outweighed by the greater convenience the minibus system will offer the handicapped. Let me be more specific.

The system of minibuses, carefully organized and run by the city, offers the handicapped door-to-door service. It is a great deal more convenient, and often safer, for handicapped persons to be picked up than for them to make their way to a bus stop. Outside of business and shopping areas, bus stops are often far apart, a particularly important consideration in a city where the terrain is so hilly and, therefore, difficult for the handicapped to manoeuvre.

Even for the handicapped who live close to a bus stop, there are problems. Our feasibility studies indicate that only one out of three buses would be supplied with lifts. As a result, the handicapped might often have a long wait for a properly

equipped bus. When tie-ups or break-downs occur, the ensuing wait at a bus stop could become extremely long, perhaps as much as two hours.

It is understandable that privately-owned minibuses have proved unreliable; however, the city will provide excellent supervision for this new system and "badly run" minibuses will be a thing of the past. We know we can deal with that problem and we feel certain that the expense of this new system will be more than compensated for by the great convenience - and added mobility - it will provide for the handicapped citizens of Pittsburgh.

Sincerely Yours,
John Carmody

Mr. John Carmody, President
Urban Systems Design
1033 Commonwealth Ave.
Cambridge, Mass. 01719

Mr. Raymond G. Beyer, Chairman
Handicapped Citizens of Greater Pittsburgh
221a S. Craig St.
Pittsburgh, Pa. 15213

Dear Mr. Beyer:

Thank you for your letter - we intend to talk with you and other members of the Handicapped Citizens of Greater Pittsburgh and I appreciate the offer of your counsel.

I realize you are concerned about minibus service, as we are also aware of the problems you've had with the services now available. However, I should like to explain our reasons for wishing to try a city-run minibus system.

1) Service to the handicapped would be better than that possible with any other vehicle. The minibus picks up passengers at their doors and delivers them to their destination. The user need not walk - or ride a wheelchair - up or down hills, need not travel any distance; and need not be exposed to bad weather. Nor need he wait, if he reserves the bus a day in advance. Rather, the bus will wait for him. If a day's notice cannot be given, the bus should be able to arrive within a few hours of the call.

We expect furthermore that minibuses will serve people who are unable to use the present system at all, the severely handicapped who cannot get to a bus stop.

2) The city of Pittsburgh has limited funds. The alternative to minis that it could afford would be equipping one-third of its coach fleet with power lifts at $10,000 each plus maintenance and trained operators. A handicapped person would have to

wait until a lift-equipped bus arrived at the bus stop - which could be an hour or more on scarcely travelled routes. It looks as if the minibus system will be about as costly, but provide better service.

3) Equipping regular buses with lifts would impose costs on non-handicapped riders which we feel are unnecessary. The power lift takes at least 30 seconds per user. If the bus travelled through an area such as Oakland in which it picked up a large number of handicapped people, it could be significantly delayed. While the city wants to provide the handicapped with good service, it also wants to maintain good service to its other customers.

The main reassurance I can give you is that the city-run minibus system would provide better service than the private systems which concern you. I would, however, like to talk with you: if you have other worries I should like to hear about them. Your advice would be valuable as we make our final choice, and I do want to ensure that you and other handicapped users will be satisfied with the transportation the city offers you.

Sincerely Yours,
John Carmody

"END OF DOCUMENT"